

**Appendix K:**  
**Transportation Impact Assessment**

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December 2019

*Final*  
Transportation Impact Assessment

# The Ranch

Prepared for:  
First Carbon Solutions  
City of Antioch







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Prepared for:  
The City of Antioch  
First Carbon Solutions

December 2019

WC19-3599

FEHR  PEERS

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# 1. Introduction

This report presents the analysis and findings of the Transportation Impact Assessment (TIA) for The Ranch (project) located in the City of Antioch, Contra Costa County. This chapter discusses the TIA purpose, study locations and analysis scenarios, analysis methods, criteria used to identify significant impacts, and report organization.

## Study Purpose and Project Description

The study's purpose is to evaluate the transportation impacts of The Ranch, a residential and commercial development on approximately 550-acres in the southeastern portion of the City of Antioch, as shown on **Figure 1**. The project site is located within the Sand Creek Focus Area and proposes to develop up to 1,177 dwelling units in 12 separate Villages. In addition to residential uses, a 5-acre area along Deer Valley Road would be designated for a Village Center. The project would also include other community facilities, including a fire station site and parks. A conceptual project site plan is shown on **Figure 2**.

The project as currently proposed consists of the following elements:

- 422 age-restricted detached single-family units
- 755 all-ages detached single-family units
- 5 acres of commercial with up to 54,000 square feet of neighborhood commercial, potentially including office and/or retail space (assumed to all be retail for the purposes of capturing the highest trip generating option)
- 3 acres of public use including a fire station site and trail staging areas
- 20 acres of park
- 2.5 acres of landscape area
- 229.5 acres of open space
- 38 acres of major roadways

The fire station would not be constructed as part of the project; however, for the purposes of evaluating the potential project impacts to the transportation system, construction of a fire station was assumed in the estimate of project trip generation.

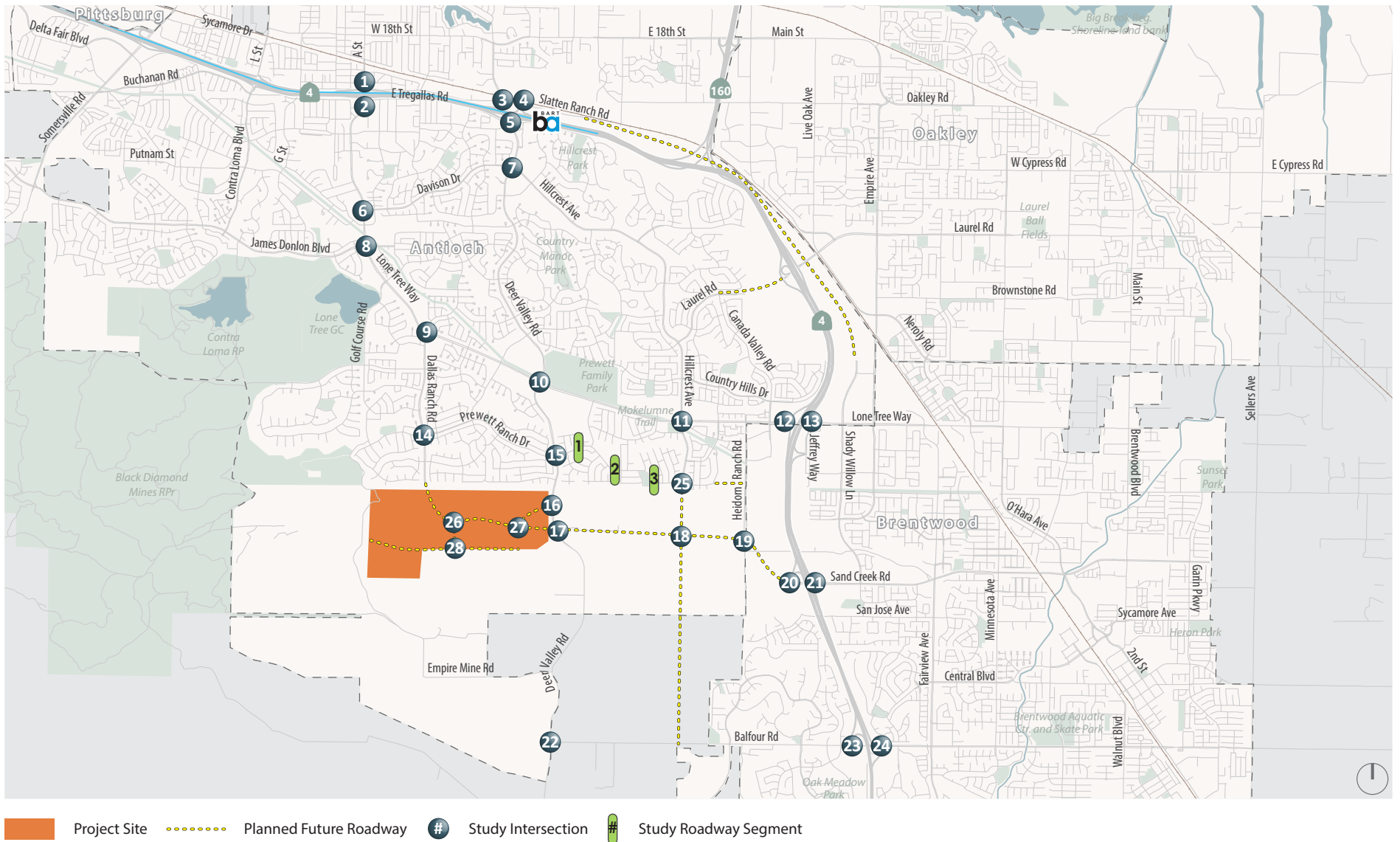
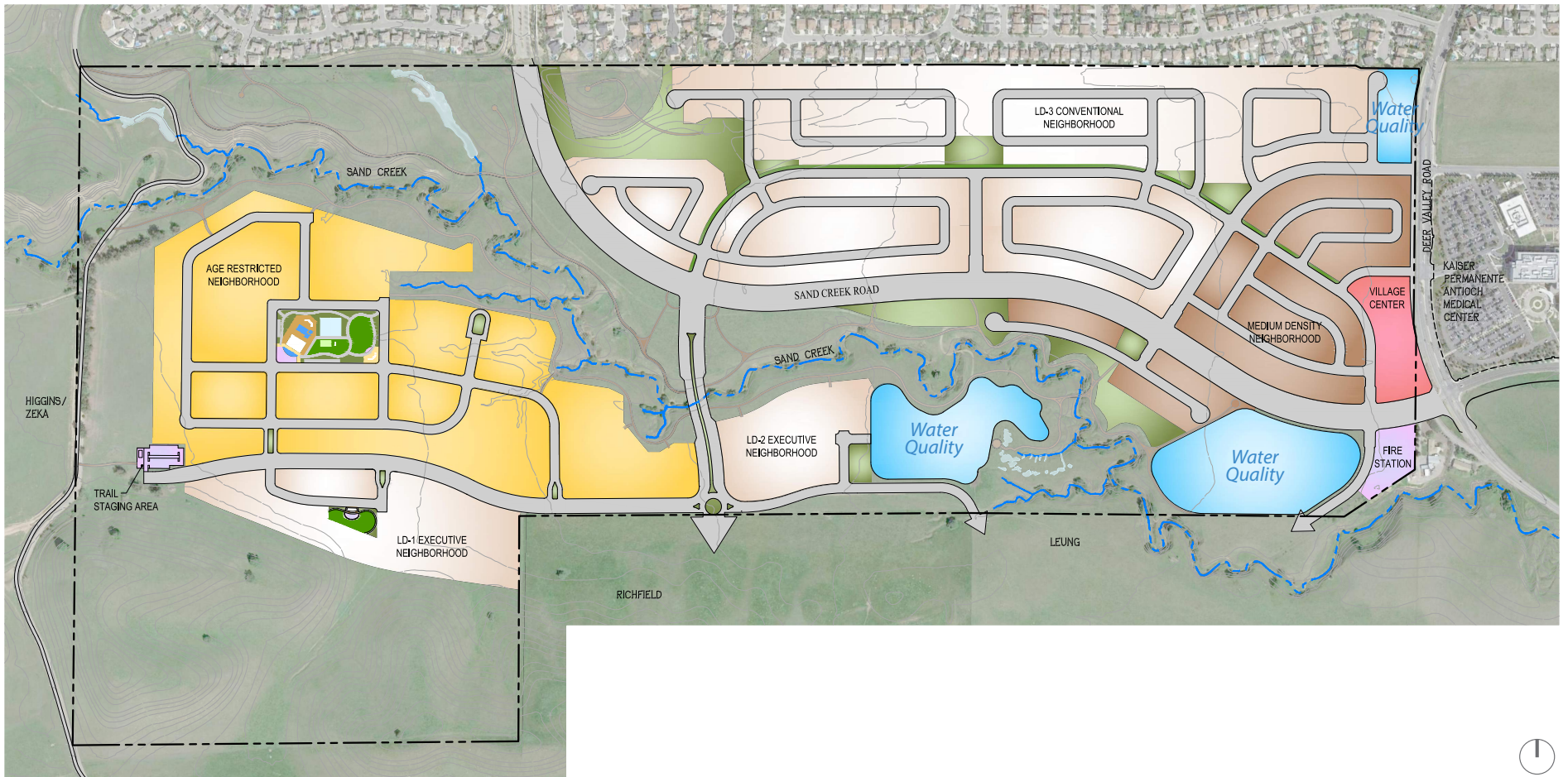


Figure 1

## Project Site Vicinity and Analysis Locations



Site Plan Source: Carlson, Barbee & Gibson, Inc., April 25, 2019



Figure 2

## Conceptual Project Site Plan

Vehicular access would occur from the future extension of Sand Creek Road which would traverse the site and connect to Dallas Ranch Road; a new roadway that would connect to Deer Valley Road at Wellness Way; and, new driveways on Deer Valley Road serving the commercial site.

Sand Creek Road through the project site would ultimately be constructed as a 4-lane arterial connecting to the current 4-lane Dallas Ranch Road cross-section. As part of the project, the west side of Deer Valley Road would be widened to provide two travel lanes in the southbound direction (two travel lanes are already provided in the northbound direction).

The project is proposed to be constructed in three phases:

- Phase 1: 421 all-ages homes, 54,000 square-feet of neighborhood commercial within the Village Center, and fire station<sup>1</sup>
- Phase 2: 201 all-ages homes
- Phase 3: 422 age-restricted and 133 all-ages homes

## Study Locations and Analysis Scenarios

Project impacts on study area roadway facilities were determined by measuring the effect project traffic would have on intersections in the vicinity of the site during the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods. The following intersections were selected based on a review of the project location, estimates of the added traffic from the project, and locations of planned roadways in the area:

1. Lone Tree Way/A Street/State Route 4 Westbound Ramps
2. Lone Tree Way/A Street/State Route 4 Eastbound Ramps
3. Hillcrest Avenue/Sunset Drive/Slatten Ranch Road
4. Slatten Ranch Road/State Route 4 Westbound Ramps
5. Hillcrest Avenue/State Route 4 Eastbound Ramps
6. Lone Tree Way/Davison Drive
7. Deer Valley Road/Hillcrest Avenue/Davison Drive
8. Lone Tree Way/James Donlon Boulevard
9. Lone Tree Way/Dallas Ranch Road
10. Lone Tree Way/Deer Valley Road

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<sup>1</sup> The fire station is not proposed to be constructed as part of the project; however, the land would be available for Contra Costa Fire to construct a station starting with Phase 1.





11. Lone Tree Way/Hillcrest Avenue
12. Lone Tree Way/State Route 4 Eastbound Ramps
13. Lone Tree Way/State Route 4 Westbound Ramps/Jeffery Way
14. Prewett Ranch Drive/Dallas Ranch Road
15. Prewett Ranch Drive/Deer Valley Road
16. Deer Valley Road/Wellness Way/Street A
17. Sand Creek Road/Deer Valley Road
18. Sand Creek Road/Hillcrest Avenue (future intersection)
19. Sand Creek Road/Heidorn Ranch Road (future intersection)
20. Sand Creek Road/State Route 4 Eastbound Ramps
21. Sand Creek Road/State Route 4 Westbound Ramps
22. Balfour Road/Deer Valley Road
23. Balfour Road/State Route 4 Eastbound Ramps
24. Balfour Road/State Route 4 Westbound Ramps
25. Prewett Ranch Drive/Hillcrest Avenue

Operations of the primary internal intersections, including Sand Creek Road at Deer Valley Road, were evaluated under roundabout and traffic signal control as presented in Chapter 9. In addition to the analysis of peak hour intersection operations, a daily roadway segment analysis was conducted for the following roadway segments:

1. Prewett Ranch Drive, east of Deer Valley Road
2. Prewett Ranch Drive at Diablo Vista Elementary School
3. Prewett Ranch Drive, west of Hillcrest Avenue

The following freeway segments were evaluated:

1. State Route 4, west of Lone Tree Way/A Street
2. State Route 4, west of Hillcrest Avenue
3. State Route 4, west of State Route 160
4. State Route 4, west of Laurel Road
5. State Route 4, west (north) of Lone Tree Way
6. State Route 4, west (north) of Sand Creek Road
7. State Route 4, west (north) of Balfour Road
8. State Route 4, east (south) of Balfour Road
9. State Route 160, north of State Route 4

The following scenarios were evaluated:

- **Existing** – Existing conditions based on recent traffic counts.
- **Existing with Project** – Existing conditions with project-related traffic.
- **Near-Term without Project** – Existing conditions with approved projects within the study area that could be constructed over the next five to ten years. Additional details are provided in Chapter 5.
- **Near-Term with Project** – Near-Term conditions with project-related traffic.
- **Cumulative without Project** – Forecasts for the cumulative scenario based on traffic growth trends as described in both the Antioch and Brentwood General Plan EIR, and supplemented by a check of traffic forecasts for the study area in the most recent Contra Costa Transportation Authority Countywide travel demand model. The scenario reflects conditions over the next 20 to 25 years. Additional details are provided in Chapter 6.
- **Cumulative with Project** – Future forecast conditions with project-related traffic.

## Analysis Methods

The operations of roadway facilities are described with the term “level of service” (LOS). LOS is a qualitative description of traffic flow from a vehicle driver’s perspective based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (free-flow conditions) to LOS F (over capacity conditions). LOS E corresponds to operations “at capacity.” When volumes exceed capacity, stop-and-go conditions result, and operations are designated LOS F.

## Signalized Intersections

Traffic conditions at signalized intersections were evaluated using methods developed by the Transportation Research Board (TRB), as documented in the *Highway Capacity Manual 6<sup>th</sup> Edition* (2016 HCM) for vehicles using the analysis software Synchro 10.0. The HCM method calculates control delay at an intersection based on inputs such as traffic volumes, lane geometry, signal phasing and timing, pedestrian crossing times, and peak hour factors. Control delay is defined as the delay directly associated with the traffic control device (i.e., a stop sign or a traffic signal) and specifically includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The relationship between LOS and control delay is summarized in **Table 1**.

**Table 1: Signalized Intersection LOS Criteria**

Level of Service	Description	Delay in Seconds
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	< 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35.0 to 55.0
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	> 80.0

Source: 2016 *Highway Capacity Manual*

## Unsignalized Intersections

For unsignalized (all-way stop controlled and side-street stop controlled) intersections, the HCM 6<sup>th</sup> Edition method for unsignalized intersections was used. With this method, operations are defined by the average control delay per vehicle (measured in seconds). The control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in queue. **Table 2** summarizes the relationship between LOS and delay for unsignalized intersections. At side-street stop-controlled intersections, the delay is calculated for each stop-controlled movement, the left turn movement from the major street, as well as the intersection average. The intersection average delay and highest movement/approach delay are reported for side-street stop-controlled intersections.

**Table 2: Unsignalized Intersection LOS Criteria**

Level of Service	Description	Delay in Seconds
A	Little or no delays	$\leq 10.0$
B	Short traffic delays	$> 10.0$ to $15.0$
C	Average traffic delays	$> 15.0$ to $25.0$
D	Long traffic delays	$> 25.0$ to $35.0$
E	Very long traffic delays	$> 35.0$ to $50.0$
F	Extreme traffic, delays where intersection capacity exceeded	$> 50.0$

Source: 2016 *Highway Capacity Manual*

## Roadway Segments

Roadway segments are evaluated by comparing daily traffic volumes on the roadway without and with the Project. For residential streets the maximum desired level of vehicle traffic is 1,500 vehicles per day (vpd). For residential collector streets with front-on housing, the maximum desired level of traffic is 3,000 vpd. For residential collectors without front-on housing, the maximum desired level of traffic is 10,000 vpd. For roadway segments that already exceed the desired threshold, the percent increase in traffic from a project is compared to the typical daily fluctuations in traffic volume, calculated using weekday traffic counts collected on each roadway segment.

## Freeway Segments

For freeway segments, the *East County Action Plan for Routes of Regional Significance*, CCTA has established the delay index as the Multimodal Transportation Service Objective (MTSO) for State Route 4 (SR 4) through the study area. The delay index is the ratio of travel time on a facility divided by the travel times that occur during non-congested free-flow periods. Should the delay index exceed 2.5 during either the AM or PM peak period, freeway operations would be considered deficient. This would equate to peak hour travel taking 2.5 times as long as off-peak travel or an average travel speed below 26 miles per hour assuming a non-congested free-flow speed of 65 miles per hour. The number of vehicles traveling in the high-occupancy vehicle (HOV) lane is also an MTSO.

For the Caltrans freeway facilities, the operational standards and significance criteria are established by the Contra Costa Transportation Authority (CCTA) acting as the designated Congestion Management Agency (CMA) representing the jurisdictions of Contra Costa County. As the acting CMA, the CCTA establishes the



traffic LOS standards for all state highway facilities in Contra Costa County, which supersede the general Caltrans operational standard for all state highways.<sup>2</sup>

## Vehicle Miles of Travel

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) has updated the California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. Draft guidelines were developed in August 2014, with final guidelines published in November 2017 incorporating public comments from the August 2014 and January 2016 guidelines. In December 2018 the California Natural Resources Agency certified and adopted the CEQA Guidelines update package along with an updated Technical Advisory related to Evaluating Transportation Impacts in CEQA (December 2018). Full compliance with the guidelines is expected by July 2020, after which vehicle-delay based level of service calculations cannot be the sole metric used to evaluate a project's impacts to the transportation system, and instead a vehicle miles of travel (VMT) metric is to be evaluated. In response to the final guidelines, a preliminary assessment of VMT generated by the proposed project was prepared for informational purposes only as the City of Antioch has not yet adopted significance thresholds related to VMT.

## Regulatory Setting and Significance Criteria

The project would have a significant impact on the environment if it would cause an increase in traffic which is substantial in relation to the traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, or delay and congestion at intersections), or change the condition of an existing street (e.g., street closures, changing direction of travel) in a manner that would substantially impact access or traffic load and capacity of the street system. Significance criteria are used to determine whether a project impact is considered significant and therefore requires mitigation. The City of Antioch strives to maintain LOS D operations at signalized intersections.

The following thresholds of significance were developed based on City of Antioch and East Contra Costa County Action Plan policies, as well as the CEQA Checklist criteria as shown below.

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<sup>2</sup> 2013 *Contra Costa Congestion Management Plan*, Contra Costa Transportation Authority, Walnut Creek, CA, 94598, December 19, 2013.



Would the project:

- A. Conflict with a program, plan, ordinance or policy addressing the circulation system, including roadway, transit, bicycle and pedestrian facilities?

**Roadway System** - The project could create a significant impact related to intersection operations if the following criteria is met:

1. Would the operations of a study intersection on a route of regional significance decline from LOS high-D (an average delay of 55 seconds for signalized intersections) or better to LOS E or F, based on the HCM LOS method, with the addition of Project traffic<sup>3</sup>?
2. Would the operations of a study intersection not on a route of regional significance decline from the established performance standard for the roadway facility type?
  - a. LOS Low-E (an average delay of 65 seconds for signalized intersections) or better to a high- LOS E or F, based on the HCM LOS method, with the addition of Project traffic for intersections within 1,000 feet of a freeway interchange? <sup>4</sup>
  - b. LOS high-D (an average delay of 55 seconds for signalized intersections) or better to a LOS E or F, based on the HCM LOS method, with the addition of Project traffic for residential and commercial portions of the Rivertown Focus Area<sup>5</sup>?
  - c. LOS mid-D (an average delay of 50 seconds for signalized intersections) or better to a high-LOS D, LOS E or F, based on the HCM LOS method, with the addition of Project traffic for residential and arterial roadways in non-regional commercial areas<sup>6</sup>?
3. Would the Project deteriorate already unacceptable operations at a signalized intersection by adding traffic?
4. Would the operations of an unsignalized study intersection decline from acceptable to unacceptable with the addition of Project traffic, and would the installation of a traffic signal based on the *Manual on Uniform Traffic Control Devices* (MUTCD) Peak Hour Signal Warrant (Warrant 3), be warranted?

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<sup>3</sup> Per the East County Action Plan, study intersections 1-3, 5-24, and 26-27 are on a designated Route of Regional Significance.

<sup>4</sup> Study intersection 4 is not on a route of regional significance and is within 1,000 feet of a freeway interchange.

<sup>5</sup> No study intersections are within this area.

<sup>6</sup> Study intersections 25 and 28 are on a designated residential or arterial roadway in non-regional commercial areas.

5. Would the Project result in or worsen unacceptable conditions on the State Route 4 mainline, based on delay index calculations?

- a. The delay index should not exceed 2.5 during the AM or PM peak hour, meaning that congested travel times should not be more than 2.5 times the uncongested travel times.

**Transit System** - The project would create a significant impact related to transit service if the following criteria is met:

1. The project interferes with existing transit facilities or precludes the construction of planned transit facilities.

**Bicycle System** - The project would create a significant impact related to the bicycle system if any of the following criteria are met:

1. Disrupt existing bicycle facilities; or
2. Interfere with planned bicycle facilities; or
3. Create inconsistencies with adopted bicycle system plans, guidelines, policies, or standards.

**Pedestrian System** - The project would create a significant impact related to the pedestrian system if any of the following criteria are met:

1. Disrupt existing pedestrian facilities; or
2. Interfere with planned pedestrian facilities; or
3. Create inconsistencies with adopted pedestrian system plans, guidelines, policies, or standards.

B. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)<sup>7</sup>?

C. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

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<sup>7</sup> This section of the CEQA Guidelines relates to the evaluation of vehicle miles of travel (VMT). As neither the City of Antioch nor the Contra Costa Transportation Authority (CCTA) have adopted guidelines and compliance with this section of the CEQA guidelines is not required until July 2020, an assessment of VMT was conducted for informational purposes only as presented in Chapter 9.

D. Result in inadequate emergency access?

## Report Organization

This report is divided into 10 chapters as described below:

- **Chapter 1 – Introduction** discusses the purpose and organization of the report.
- **Chapter 2 – Existing Conditions** describes the transportation system in the project vicinity, including the surrounding roadway network morning and evening peak period intersection turning movement volumes, existing bicycle, pedestrian, and transit facilities, and intersection operations.
- **Chapter 3 – Project Characteristics** presents relevant project information, such as the project components and project trip generation, distribution, and assignment.
- **Chapter 4 – Existing with Project Traffic Conditions** addresses the existing conditions with the project and discusses project vehicular impacts.
- **Chapter 5 – Near-Term Traffic Conditions** addresses the near-term future conditions, both without and with the project, and discusses project vehicular impacts.
- **Chapter 6 – Cumulative Traffic Conditions** addresses the long-term future conditions, both without and with the project, and discusses project vehicular impacts.
- **Chapter 7 – Phasing Analysis** presents the results of a phasing analysis conducted for the project to identify impacts associated with each development phase.
- **Chapter 8 – Freeway Analysis** presents the results of the freeway analysis under existing, near-term and cumulative conditions.
- **Chapter 9 – Site Plan Review** describes project access and circulation for all travel modes, including an assessment of roundabout control at the internal intersections. An assessment of the non-auto operations significance criteria is also provided.
- **Chapter 10 – Vehicle Miles of Travel** presents the results of the VMT assessment conducted for the site.

## 2. Existing Conditions

This chapter describes transportation facilities in the project study area, including the surrounding roadway network, transit, pedestrian, and bicycle facilities in the project site vicinity. Existing intersection operations are also described.

### Roadway System

The project site is bound by medium density single-family homes to the north, Deer Valley Road and Kaiser Hospital to the east, undeveloped land to the south, and Empire Mine Road, Black Diamond Mine Preserve and undeveloped land to the west. Antioch is in eastern Contra Costa County, adjacent to the cities of Oakley and Brentwood, located east and southeast, respectively. Land uses surrounding the project site are residential, medical, or undeveloped.

Regional access to the site is provided by State Route 4, Lone Tree Way, Deer Valley Road and, once extended, Sand Creek Road. Dallas Ranch Road provides local access. The following discusses the roadways that would provide access to the site and are most likely to experience direct traffic impacts, if any, from the proposed project.

**State Route 4 (SR 4)** is an east-west freeway that extends from Hercules in the west to Stockton and beyond in the east. In the study area, SR 4 has an east/west orientation from west of SR 160 and a northwest/southeast orientation between SR 160 and Walnut Boulevard in eastern Contra Costa County. The facility is an eight-lane freeway in the west to State Route 160, a six-lane freeway from Route 160 to Laurel Road and a four-lane freeway from Laurel Road to Balfour Road. At Balfour Road, it transitions to a two-lane highway with at-grade intersections at Marsh Creek Road, and beyond. Each ramp-terminal intersection is signalized and operated by the California Department of Transportation (Caltrans). State Route 4 is a designated route of regional significance by the Contra Costa County Transportation Agency (CCTA). Routes of regional significance are roadways that connect two or more subareas of Contra Costa, cross county boundaries, carry significant through traffic, and/or provide access to a regional highway or transit facility.

**Lone Tree Way** has a northwest to southeast orientation in the study area, with two interchanges with State Route 4 – the westernmost interchange is where Lone Tree Way continues as A Street into Downtown Antioch; in the east, the interchange provides access to the City of Brentwood as well as eastern Antioch. The roadway provides two travel lanes in both directions to the north of James Donlon Boulevard with a posted speed limit of 35 miles per hour (mph), and three travel lanes in both directions south and east of

James Donlon Boulevard with a posted speed limit of 45 mph. With a few exceptions, no on-street parking is permitted. Lone Tree Way is a designated route of regional significance.

**Sand Creek Road** is a four-lane, east-west roadway that extends east from State Route 4 through Brentwood. The posted speed limit is 45 mph. No on-street parking is permitted on Sand Creek Road. Class II bicycle lanes and sidewalks are provided along most of the roadway through Brentwood. Sand Creek Road from Brentwood Boulevard to its current terminus at State Route 4 is a route of regional significance. When constructed, the future extension of Sand Creek Road would also be a designated route of regional significance.

**Deer Valley Road** is a north-south roadway connecting Brentwood to Antioch. From Balfour Road north to the Sand Creek Focus Area, it is two-lane rural road with adjacent areas mostly undeveloped and agricultural ranchettes. Along the rural section there are no bicycle or pedestrian facilities, or paved shoulders. North of Sand Creek Road at Kaiser Medical Center, Deer Valley Road has been improved to provide two-travel lanes in the northbound direction, sidewalks and Class II bicycle facilities on the east side of the roadway; a shoulder has been added to the southbound travel lane. At Mammoth Way, Deer Valley Road provides two travel lanes in each direction, Class II bicycle lanes and sidewalks. North of Sand Creek Road, a center median allows for the provision of left-turn pockets at intersections. Deer Valley has a posted speed limit of 45 miles per hour and is a designated route of regional significance.

**Dallas Ranch Road** is a four-lane north-south roadway that would connect the proposed Sand Creek Road extension within the project site to Lone Tree Way. Two travel lanes are provided in each direction with bicycle lanes and sidewalks. No direct residential access is provided from Dallas Ranch Road. The posted speed limit on Dallas Ranch Road is 45 miles per hour although it is temporarily posted at 25 mph approaching the southerly terminus.

## Existing Pedestrian and Bicycle Facilities

Pedestrian facilities in the study area include sidewalks, crosswalks, pedestrian signals and multi-use trails. Improved roadways in the study area generally provide sidewalks on both sides of the street. No sidewalks or other transportation infrastructure currently exist on site, but would be constructed with the project. At the signalized intersections in the area, crosswalks and pedestrian push-button actuated signals are provided.



Bicycle facilities include the following:

- **Bike paths (Class I)** – Paved trails that are separated from roadways. These trails are sometimes shared with pedestrians.
- **Bike lanes (Class II)** – Lanes on roadways designated for use by bicycles through striping, pavement legends, and signs.
- **Bike routes (Class III)** – Roadways designated for bicycle use by signs only; may or may not include additional pavement width for cyclists.
- **Separated Bikeway (Class IV)** – Separated bikeways, also referred to as cycle tracks or protected bikeways, are bikeways for the exclusive use of bicycles which are physically separated from vehicle traffic. Separated Bikeways were adopted by Caltrans in 2015. Types of separation may include, but are not limited to, grade separation, flexible posts, physical barriers, or on-street parking.

In the immediate project vicinity, portions of Deer Valley Road and Dallas Ranch Road provide Class II bicycle facilities with separate lanes designated for bicycle travel. Lone Tree Way from E. Tregallas Road to the eastern Lone Tree Way/State Route 4 interchange provides Class II or Class III bicycle facilities, with Class III accommodations (pavement marking only, shared with vehicle travel lane) being the predominant bicycle facility. The Class I Mokelumne Trail is located north of the project site, with a grade separated crossing proposed at State Route 4, to connecting to the existing trail section in Brentwood. The Mokelumne Trail ultimately connects to the Pittsburg/Bay Point BART Station. There are numerous existing Class I trails in the existing Dallas Ranch and Prewett Ranch neighborhoods connecting residential neighborhoods to parks and schools.

## Existing Transit Service

The Eastern Contra Costa Transit Authority (Tri Delta Transit) provides transit service in eastern Contra Costa County, serving the communities of Brentwood, Antioch, Oakley, Concord, Discovery Bay, Bay Point and Pittsburg. Fifteen routes operate on weekdays and five routes operating on weekends. Three routes operate in the vicinity of the Project site, with Routes 379, 388, and 392 stopping at the Kaiser Medical Center on Deer Valley Road, opposite from the project site. Route 388 also has stops on Dallas Ranch Road and Prewett Ranch Road.

Route 388 operates weekdays between 5:30 AM and 11:30 PM on 20-minute to one-hour headways, connecting the Pittsburg/Bay Point BART station and Kaiser Medical Center, while also serving the Sutter Delta Medical Center, Downtown Antioch, Antioch BART, Pittsburg Center BART, the Pittsburg Civic Center

and numerous schools. In the study area, Route 388 operates on Dallas Ranch Road, Prewett Ranch Drive and Deer Valley Road. Route 392 provides weekend service to the same general destinations as Route 388 on hour headways between 7:15 AM and midnight.

Route 379 provides weekday service with one morning (7:15 AM) bus from the Antioch BART station to Kaiser Medical Center, and one afternoon bus (3:05 PM) from the Kaiser Medical Center to Antioch BART.

In addition to the regular transit service to the study area, dial-a-ride door-to-door service within Eastern Contra Costa County is provided by Tri Delta Transit for disabled people of all ages and senior citizens. A microtransit pilot program (Tri MyRide) was launched in June 2019 to provide on-demand rideshare service within specific boundaries connecting riders to key destinations, include the Antioch BART station and key shopping destinations. The service area boundaries are Highway 4, Long Tree Way, and Deer Valley Road. Rides cost \$2. If successful, the program could be expanded.

Bay Area Rapid Transit (BART) provides fixed rail transit to Eastern Contra Costa County. The terminus station is located in Antioch at Hillcrest Avenue, approximately four miles from the project site vicinity with timed transfers from traditional BART transit to clean diesel BART trains at the Pittsburg/Bay Point BART station. Weekday service is provided on approximately 15-minute headways and weekend service is provided on approximately 20-minute headways. The Antioch Line connects to key regional employment centers, including Concord, Pleasant Hill, Walnut Creek, Oakland and San Francisco. Transfers to other lines can be made in Oakland.

## Existing Traffic Counts

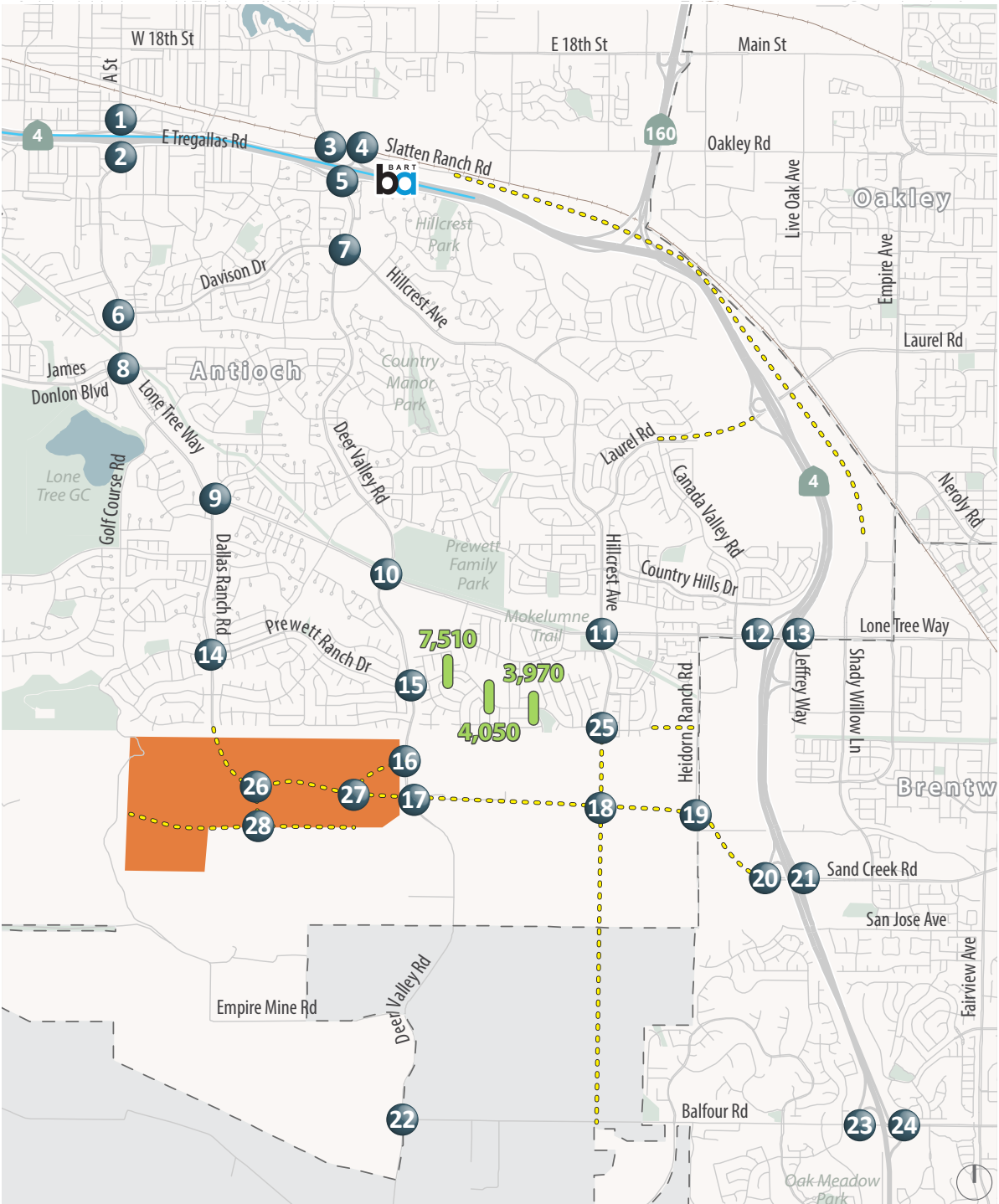
Weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak period intersection turning movement counts were collected at the study intersections listed below, including separate counts of pedestrians, bicyclists and heavy vehicles. Traffic counts at the italicized intersections were collected in May and August 2019 with area schools in normal session. At the italicized intersections, previously collected counts from 2017 and the recent 2019 counts were compared. Around the Hillcrest Avenue interchange, traffic volumes changed dramatically due to the opening of the BART station in 2018. However, at intersections away from the freeway, traffic volumes decreased slightly between 2017 and 2019. At non-italicized intersections, 2017 data remains reflective of current conditions based on spot counts collected at other locations. The 2017 data was, however, increased by two percent to reflect that some traffic changes may have occurred. 72-hour counts (Tuesday through Thursday) were collected on the three roadway segments in August 2019 with area schools in normal session.

1. Lone Tree Way/A Street/State Route 4 Westbound Ramps



2. Lone Tree Way/A Street/State Route 4 Eastbound Ramps
3. *Hillcrest Avenue/Sunset Drive/Slatten Ranch Road*
4. *Slatten Ranch Road/State Route 4 Westbound Ramps*
5. *Hillcrest Avenue/State Route 4 Eastbound Ramps*
6. Lone Tree Way/Davison Drive
7. *Deer Valley Road/Hillcrest Avenue/Davison Drive*
8. Lone Tree Way/James Donlon Boulevard
9. Lone Tree Way/Dallas Ranch Road
10. Lone Tree Way/Deer Valley Road
11. *Lone Tree Way/Hillcrest Avenue*
12. *Lone Tree Way/State Route 4 Eastbound Ramps*
13. *Lone Tree Way/State Route 4 Westbound Ramps/Jeffery Way*
14. Prewett Ranch Drive/Dallas Ranch Road
15. Prewett Ranch Drive/Deer Valley Road
16. Deer Valley Road/Wellness Way/Street A
17. Sand Creek Road/Deer Valley Road
18. Sand Creek Road/Hillcrest Avenue (future intersection)
19. Sand Creek Road/Heidorn Ranch Road (future intersection)
20. *Sand Creek Road/State Route 4 Eastbound Ramps*
21. *Sand Creek Road/State Route 4 Westbound Ramps*
22. *Balfour Road/Deer Valley Road*
23. *Balfour Road/State Route 4 Eastbound Ramps*
24. *Balfour Road/State Route 4 Westbound Ramps*
25. *Prewett Ranch Drive at Hillcrest Avenue*

Peak hour intersection vehicle volumes are summarized on **Figure 3** along with existing lane configurations and traffic controls. Bicycle and pedestrian counts are presented on **Figure 4**; as shown on **Figure 4**, existing bicycle and pedestrian activity at the study intersections is generally low. The traffic counts for existing conditions are provided in **Appendix A**.

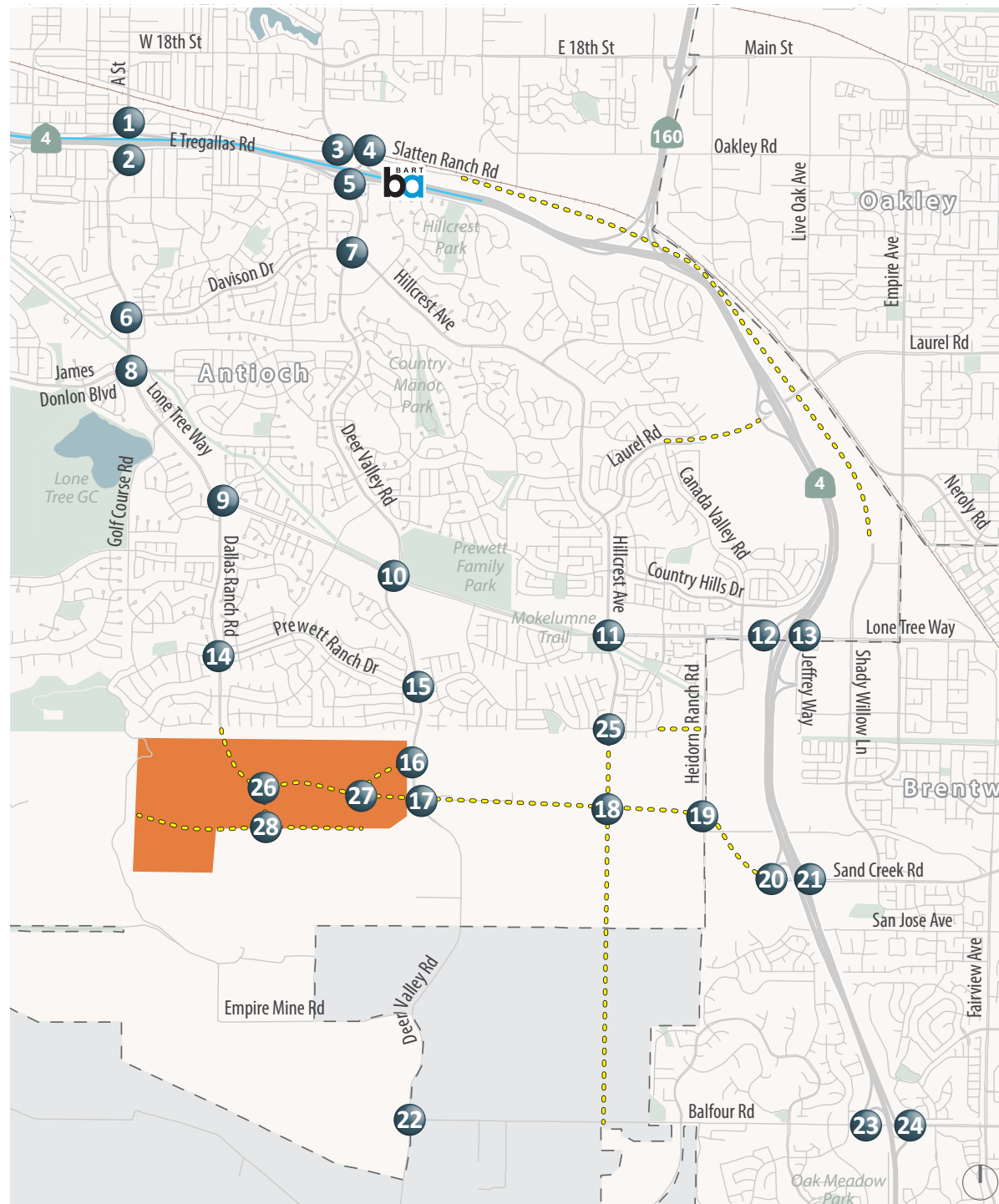


XX (YY) AM (PM) Peak Hour Traffic Volumes  
Signalized Intersection  
Stop Sign  
Project Site  
Planned Future Roadway  
Study Intersection  
Future Intersection  
Daily Roadway Segment Volume

<p>1. Lone Tree Way/SR 4 (Westbound Ramps)</p>	<p>2. Lone Tree Way/SR 4 (Eastbound Ramps)</p>	<p>3. Hillcrest Avenue/Sunset Drive/Slatten Ranch</p>	<p>4. SR 4 WB Ramps/Slatten Ranch</p>	<p>5. Hillcrest Avenue/SR 4 Eastbound Ramps</p>
<p>6. Lone Tree Way/Davison Drive</p>	<p>7. Hillcrest Ave/Deer Valley Rd/Davison Dr</p>	<p>8. Lone Tree Way/James Donlon Blvd/Ridgerock Dr</p>	<p>9. Eagleridge Dr/Dallas Ranch Rd/Lone Tree Way</p>	<p>10. Deer Valley Road/Lone Tree Way</p>
<p>11. Hillcrest Avenue/Lone Tree Way</p>	<p>12. SR 4 Eastbound/Lone Tree Way</p>	<p>13. SR 4 Westbound/Lone Tree Way</p>	<p>14. Dallas Ranch Rd/Prewett Ranch Dr/Prewett Ranch Rd</p>	<p>15. Deer Valley Road/Prewett Ranch Drive</p>
<p>16. Deer Valley Road/Wellness Way</p>	<p>17. Deer Valley Road/Sand Creek Road</p>	<p>18. Hillcrest Avenue/Sand Creek Road</p>	<p>19. Heidorn Ranch Road/Sand Creek Road</p>	<p>20. SR 4 (EB Ramps)/Sand Creek Road</p>
<p>21. SR 4 (WB Ramps)/Sand Creek Road</p>	<p>22. Deer Valley Road/Balfour Road</p>	<p>23. SR-4 EB Ramps/Balfour Road</p>	<p>24. SR-4 WB Ramps/Balfour Road</p>	<p>25. Hillcrest Avenue/Prewett Ranch Drive</p>

Figure 3  
Existing Peak Hour  
Intersection Traffic Volumes, Lane Configurations and Traffic Controls and Daily Roadway Segment Volumes





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Planned Future Roadway

Study Intersection

Future Intersection

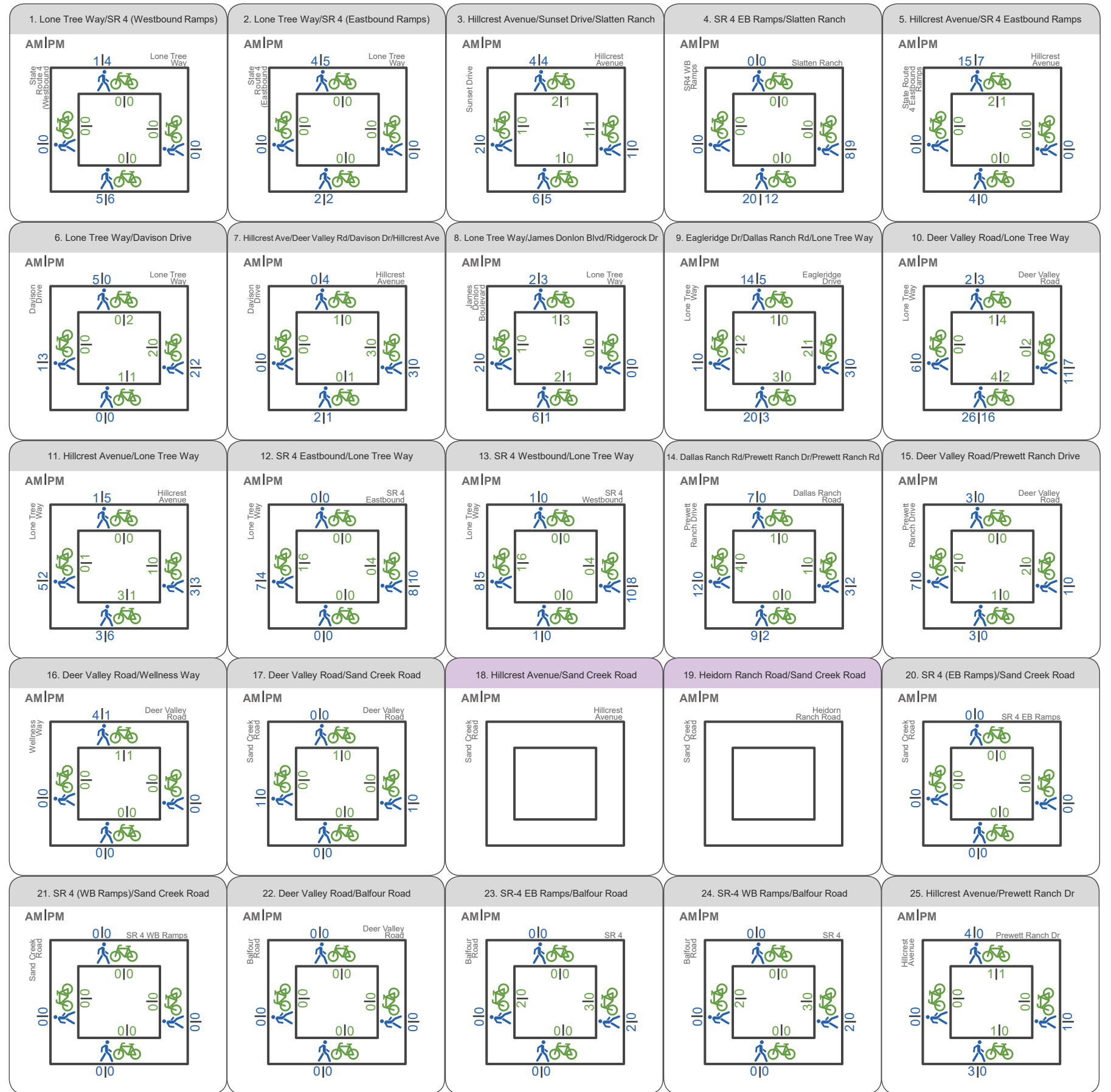


Figure 4

Existing  
Peak Hour Pedestrian and Bicycle Volumes





## Existing Intersection Levels of Service

Existing intersection lane configurations, signal timings, and peak hour turning movement volumes were used to calculate the levels of service for the study intersections during each peak hour using the Synchro 10.0 software program, as presented in **Table 3**. Observed peak hour factors<sup>8</sup> were used at all intersections for the existing analysis. Pedestrian and bicycle activity were also factored into the analysis. Detailed intersection LOS calculation worksheets are presented in **Appendix B**. As shown, signalized study intersections generally operate within the level of service standards set by the City of Antioch and Contra Costa County, except for the Hillcrest Avenue/State Route 4 Eastbound Ramp intersection, which operates at an overall LOS F during the evening peak hour. Poor operations are primarily due to the close proximity of the adjacent intersection (Hillcrest Avenue at Tregallas Road/Larkspur Drive), poor vehicle progression between closely spaced intersections which does not make efficient use of green time, and lane utilization imbalances for the eastbound right-turn movement from the off-ramp as well as the northbound through movement.

The unsignalized intersection of Deer Valley Road at Balfour Road currently operates at an acceptable level; however, previous data collection efforts and analyses noted deficient operations for this intersection. Completion of the Balfour Road interchange and associated State Route 4 widening between Sand Creek Road and Balfour Road may have resulted in travel pattern shifts, with more vehicles traveling on State Route 4, versus Deer Valley and other parallel roadways. To assess the need for signalization of stop-controlled intersections, the Manual of Uniform Traffic Control (MUTCD) (Federal Highway Administration 2009) presents nine signal warrants. The Peak Hour Volume Warrant and the Peak Hour Delay Warrant were used in this study as a supplemental analysis tool to assess operations at the unsignalized intersections.<sup>9</sup> The Deer Valley Road at Balfour Road intersection does not meet peak hour signal warrants during the morning peak hour. **Appendix C** provides the existing conditions signal warrant worksheets.

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<sup>8</sup> The peak hour factor is the relationship between the peak 15-minute flow rate and the full hourly volume:  $PHF = \text{Hourly volume} / (4 \times (\text{volume during the peak 15 minutes of flow}))$ . The analysis level of service is based on peak rates of flow occurring within the peak hour because substantial short-term fluctuations typically occurring during an hour.

<sup>9</sup> Unsignalized intersection warrant analysis is intended to examine the general correlation between existing conditions and the need to install new traffic signals. Existing peak-hour volumes are compared against a subset of the standard traffic signal warrants recommended in the MUTCD and associated State guidelines. This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated based on field-measured traffic data and a thorough study of traffic and roadway conditions by an experienced engineer. Furthermore, the decision to install a signal should not be based solely on the warrants because the installation of signals can lead to certain types of collisions. The responsible State or local agency should undertake regular monitoring of actual traffic conditions and accident data and conduct a timely re-evaluation of the full set of warrants in order to prioritize and program intersections for signalization.

**Table 3: Existing Conditions Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Delay <sup>2</sup>	LOS
1. Lone Tree Way/A Street/State Route 4 Westbound Ramps	Signal	AM PM	13 9	B A
2. Lone Tree Way/A Street/State Route 4 Eastbound Ramps	Signal	AM PM	15 15	B B
3. Hillcrest Avenue/Sunset Drive/Slatten Ranch Road	Signal	AM PM	18 17	B B
4. Slatten Ranch Road/State Route 4 Westbound Ramps	Signal	AM PM	8 8	A A
5. Hillcrest Avenue/State Route 4 Eastbound Ramps	Signal	AM PM	30 <b>90</b>	C <b>F</b>
6. Lone Tree Way/Davison Drive	Signal	AM PM	17 15	B B
7. Deer Valley Road/Hillcrest Avenue/Davison Drive	Signal	AM PM	26 29	C C
8. Lone Tree Way/James Donlon Boulevard	Signal	AM PM	19 16	B B
9. Lone Tree Way/Dallas Ranch Road	Signal	AM PM	27 16	C B
10. Lone Tree Way/Deer Valley Road	Signal	AM PM	30 21	C C
11. Lone Tree Way/Hillcrest Avenue	Signal	AM PM	19 20	B C
12. Lone Tree Way/State Route 4 Eastbound Ramps	Signal	AM PM	17 32	B C
13. Lone Tree Way/State Route 4 Westbound Ramps/Jeffery Way	Signal	AM PM	9 12	A B
14. Prewett Ranch Drive/Dallas Ranch Road	Signal	AM PM	19 14	B B
15. Prewett Ranch Drive/Deer Valley Road	Signal	AM PM	27 14	C B
16. Deer Valley Road/Wellness Way/Street A	Signal	AM PM	7 5	A A
17. Sand Creek Road/Deer Valley Road	Signal	AM PM	9 7	A A
18. Sand Creek Road/Hillcrest Avenue (future intersection)	Signal	AM PM	-- --	-- --
19. Sand Creek Road/Heidorn Ranch Road (future intersection)	Signal	AM PM	-- --	-- --
20. Sand Creek Road/State Route 4 Eastbound Ramps	Signal	AM PM	4 4	A A

**Table 3: Existing Conditions Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Delay <sup>2</sup>	LOS
21. Sand Creek Road/State Route 4 Westbound Ramps	Signal	AM PM	5 6	A A
22. Balfour Road/Deer Valley Road	SSSC	AM PM	14 (23) 11 (14)	B (C) B (B)
23. Balfour Road/State Route 4 Eastbound Ramps	Signal	AM PM	33 30	C C
24. Balfour Road/State Route 4 Westbound Ramps	Signal	AM PM	25 23	C C
25. Prewett Ranch Drive at Hillcrest Avenue	Signal	AM PM	19 16	B B

Notes:

1. Signal = signalized intersection; SSSC = side-street stop-control

2. Average intersection delay is calculated for all signalized intersections using the HCM method for vehicles.

Source: Fehr & Peers, 2019

Average and 95th percentile vehicle queues were calculated for left-turn movements using Synchro 10.0 with detailed queuing reports and a summary table provided in **Appendix D**. The average queue refers to the typical vehicle length of vehicle queue, while the 95th percentile queue generally reflects the maximum vehicle queue length that might occur a few times during the peak hour. In the existing condition, average turning movement vehicle queues are contained within the available storage; however, at some intersections, the maximum vehicle queues for some left-turn movements periodically extend beyond the available storage, including:

- Lone Tree Way/A Street/State Route 4 Westbound Ramps (northbound left movement, AM peak hour)
- Hillcrest Avenue/Sunset Drive/Slatten Ranch Road (northbound left movement, AM peak hour)
- Lone Tree Way/Davison Drive (westbound left, AM peak hour, northbound left, PM peak hour)
- Hillcrest Avenue /Davison Drive/Deer Valley Road (eastbound left, AM Peak Hour; northbound left, PM peak hour)
- Lone Tree Way/ James Donlon Boulevard/Ridgerock Drive (eastbound left and southbound left AM and PM peak hours)
- Lone Tree Way/Dallas Ranch Road/Eagleridge Drive (eastbound left-turn and northbound left-turn, AM peak hour and PM peak hour)
- Lone Tree Way/Deer Valley Road (northbound left-turn, AM peak hour)
- Lone Tree Way/State Route 4 Eastbound Ramps (southbound left, AM and PM peak hour)



- Lone Tree Way/State Route 4 Westbound Ramps/Jeffery Way (northbound left-turn, AM and PM peak hour)
- Prewett Ranch Drive/Dallas Ranch Road (southbound left, AM peak hour)
- Prewett Ranch Drive/Deer Valley Road (westbound left, AM peak hour)
- Balfour Road/State Route 4 Eastbound Ramps (northbound left-turn, AM peak hour)

Queue spillback from left-turn pockets may occur one to two times within the peak hour, potential extending to the thought lane. However, the queues tend to dissipate quickly.

## Daily Roadway Segment Operation

Automatic machine traffic counts were conducted over a 72-hour period (Tuesday through Thursday) on clear days in August 2019 with area schools in session along Prewett Ranch Drive as some vehicle traffic accessing the site could travel through Prewett Ranch Drive to access Hillcrest Avenue and Sand Creek Road prior to the completion of the Sand Creek Road extension between Hillcrest Avenue and Deer Valley Road. The average daily traffic volumes on these roadways are summarized below in **Table 4** and previously on **Figure 3**. Prewett Ranch Drive carries approximately 7,510 vehicles per day east of Deer Valley Road. In the vicinity of the school, traffic volumes are approximately 4,050 per day. West of Hillcrest Avenue, average daily traffic volumes decrease to approximately 3,970, which is higher than the desired amount for a residential collector roadway that has front-on housing. The peak hour of travel along the Prewett Ranch Drive corridor tends to align with school bell times.

**Table 4: Average Daily Traffic**

Segment	Daily Traffic <sup>1</sup>	Peak Hourly Traffic <sup>2</sup>	Daily Fluctuation <sup>3</sup>
1. Prewett Ranch Drive, east of Deer Valley Road	7,510	850	± 1.2%
2. Prewett Ranch Drive at Diablo Vista Elementary School	4,050	460	± 1.8%
3. Prewett Ranch Drive, west of Hillcrest Avenue	3,970	430	± 2.9%

Notes: 1. Average daily two-way traffic measured over three days.  
2. Average peak hour volume from the three weekdays of data collection.  
3. Percent difference between the three days of data collection.

Source: Fehr & Peers, 2019

## 3. Project Characteristics

This chapter provides an overview of the proposed project components and addresses the proposed project trip generation, distribution, and assignment characteristics, allowing for an evaluation of project impacts on the surrounding roadway network. The amount of traffic associated with the project was estimated using a three-step process:

1. **Trip Generation** – The *amount* of vehicle traffic entering/exiting the project site was estimated.
2. **Trip Distribution** – The *direction* trips would use to approach and depart the site was projected.
3. **Trip Assignment** – Trips were then *assigned* to specific roadway segments and intersection turning movements.

## Project Description

The approximately 550-acre project site is located in the southeastern portion of the City of Antioch, within the Sand Creek Focus Area. The site is bound on the north by medium-density single-family homes, on the east by Deer Valley Road and Kaiser Hospital, on the south by undeveloped land, and on the west by Empire Mine Road, Black Diamond Mine Preserve and undeveloped land. The site is currently undeveloped with the exception of an agricultural facility on Snodgrass Lane between Deer Valley and Empire Mine Roads. This facility includes a cattle grazing operation, one residential structure, and various barns and outbuildings located in the eastern portion of the site that would be removed as part of the project. Sand Creek bisects the project site.

The project proposes to develop up to 1,177 dwelling units in several separate neighborhoods. In addition to residential uses, a five-acre area along Deer Valley Road would be designated for a Village Center, which could include neighborhood commercial uses, childcare or office uses. The project site would also include other community facilities, including a fire station site (to be constructed by the fire district) and parks.

The project as currently proposed consists of the following elements:

- 422 active-adult age restricted detached single-family units
- 755 all-ages detached single-family units
- 5 acres of commercial with up to 54,000 square feet of neighborhood commercial, potentially including, daycare office and/or retail space
- 3 acres of public use, including a fire station site and trail staging areas

- 20 acres of park
- 2.5 acres of landscape area
- 229.5 acres of open space
- 38 acres of major roadways

The fire station would not be constructed as part of the project; however, for the purposes of evaluating the potential project impacts to the transportation system, construction of a fire station in the first phase was assumed in the estimate of project trip generation.

Vehicular access would occur from the future extension of Sand Creek Road which would traverse the site and connect to Dallas Ranch Road, a new roadway that would connect to Deer Valley Road at Wellness Way, and new driveways on Deer Valley Road serving the commercial site.

Sand Creek Road through the project site would ultimately be constructed as a 4-lane arterial connecting to the current four-lane Dallas Ranch Road cross-section. As part of the project, the west side of Deer Valley Road would be widened to provide two travel lanes in the southbound direction (two travel lanes are already provided in the northbound direction).

The project is proposed to be constructed in three phases, with 421 all-ages homes and 54,000 square-feet of neighborhood commercial in Phase 1; 201 all-ages homes in Phase 2; and, 422 age-restricted, and 133 all-ages homes in Phase 3. Although not included as part of the project, construction of the fire station is assumed to occur in Phase 1.

## Project Trip Generation

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. Estimates are created for the daily condition and for the peak one-hour period during the morning and evening commute when traffic volumes on the adjacent streets are typically the highest. Project trip generation was estimated using rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition), with the resulting estimates presented in **Table 5** assuming that the Village Center is developed with retail and in **Table 6** assuming the Village Center is developed with Office.

With the Village Center developed with all retail uses, the project is expected to generate approximately 10,990 daily vehicle trips, including approximately 713 morning peak hour and 1,083 evening peak hour trips, including the trip generating potential of the commercial uses on Deer Valley Road and the fire station. With the Village Center developed with all office uses, the project is expected to generate 9,480 daily trips, including 725 morning peak hour and 939 evening peak hour trips. Overall, the retail option is expected to

generate significantly more daily and PM peak hour trips than an office development; during the morning peak hour, an office development would generate 22 more inbound trips as compared to a retail development, but fewer outbound trips (12 more overall trips). This slight difference in trip generation is not expected to result in changed conclusions for the assessment of AM peak hour operations in the area, and would likely result in better travel conditions as it would provide more employment opportunities in the area. Therefore, for the purposes of the traffic analysis, development of an all commercial/retail center was assumed.

It is expected that some proportion of trips generated by the proposed Village Center would have an origin or destination within the residential portion of the development. However, as there are not specific uses proposed, the level of internal trip making is difficult to quantify. Additionally, given the size of the project, it is expected that many trips to the Village Center originating from the residential uses would be vehicle trips. Therefore, internal trips are considered in the project trip assignment phase.

For the Village Center if developed as a retail center, a proportion of the trips could be trips that are already on the roadway system. These trips are typically referred to as pass-by or diverted trips. However, as the proposed uses are unknown and through traffic volumes are relatively low on the portion of Deer Valley Road adjacent to the project site, no pass-by or diverted trip reductions were considered in the initial trip generation estimates. As the project commercial components are better defined, the application of appropriate pass-by rates and recalculation of applicable fair-share contributions (if applicable) is recommended.

## Project Trip Distribution and Assignment

Project trip distribution refers to the directions of approach and departure that vehicles would take to access and leave the site. Estimates of regional project trip distribution were developed based on existing travel patterns in the area, a select zone analysis using the Contra Costa Transportation Authority (CCTA) travel demand model, and the location of complementary land uses, such as schools, employment centers, and retail/recreational opportunities. Separate estimates were developed for the residential and commercial portions of the project as they are likely to have different trip distribution patterns. The resulting trip distribution percentages are shown on **Figure 5**. Project trips were then assigned to the roadway network as shown on **Figure 6** for the existing roadway network, **Figure 7** for the near-term roadway network, and **Figure 8** for the cumulative roadway network. The volumes presented in these figures represent the full project build-out.

Trip assignment by phase is presented in Chapter 7.

**Table 5: Vehicle Trip Generation Estimates – Retail Option at Village Center**

Use	Size	Weekday						
		Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Phase 1								
All-Ages Single Family Homes <sup>1</sup>	421 dwelling units	3,970	78	234	312	263	154	417
Village Center – Retail <sup>2</sup>	54,000 square feet	2,040	32	19	51	99	107	206
Fire Station <sup>3</sup>		20	1	1	2	1	1	2
Phase 1 Subtotal Total		6,030	111	254	365	363	262	625
Phase 2								
All-Ages Single Family Homes <sup>1</sup>	201 dwelling units	1,900	37	112	149	125	74	199
Phase 3								
All-Ages Single Family Homes <sup>1</sup>	133 dwelling units	1,260	25	73	98	83	49	132
Age-Restricted Single Family Homes <sup>4</sup>	422 dwelling units	1,800	33	68	101	77	50	127
Phase 3 Subtotal		3060	58	141	199	160	99	259
Total Project Trips		10,990	206	507	713	648	435	1,083

- ITE land use category 210 – Single-Family Homes (Adj Streets, 7-9A, 4-6P):  
Daily: (T) = 9.44 (X)  
AM Peak Hour: T = 0.74(X); Enter = 25%; Exit = 75%  
PM Peak Hour: T = 0.99 (X); Enter = 63%; Exit = 37%
- ITE land use category 820 – General Commercial (Adj Streets, 7-9A, 4-6P):  
Daily: (T) = 37.75 (X)  
AM Peak Hour: T = 0.94 (X); Enter = 62%; Exit = 38%  
PM Peak Hour: T = 3.81 (X); Enter = 48%; Exit = 52%
- Based on Observations of Fire Stations 9, 70 and 86 in Contra Costa County
- ITE land use category 252 - Senior Adult Housing - Attached (Adj Streets, 7-9A, 4-6P):  
Daily: (T) = 4.27 (X)  
AM Peak Hour: T = 0.24 (X); Enter = 33%; Exit = 67%  
PM Peak Hour: T = 0.30 (X); Enter = 61%; Exit = 39%

Source: *Trip Generation Manual* (10th Edition), ITE, 2019; Fehr & Peers, 2019

**Table 6: Vehicle Trip Generation Estimates – Office Option at Village Center**

Use	Size	Weekday						
		Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Phase 1								
All Ages Single Family Homes <sup>1</sup>	421 dwelling units	3,970	78	234	312	263	154	417
Village Center – Office <sup>2</sup>	54,000 square feet	530	54	9	63	10	52	62
Fire Station <sup>3</sup>		20	1	1	2	1	1	2
Phase 1 Subtotal Total		4,520	133	244	377	274	207	481
Phase 2								
All Ages Single Family Homes <sup>1</sup>	201 dwelling units	1,900	37	112	149	125	74	199
Phase 3								
All Ages Single Family Homes <sup>1</sup>	133 dwelling units	1,260	25	73	98	83	49	132
Age Restricted Single Family Homes <sup>4</sup>	422 dwelling units	1,800	33	68	101	77	50	127
Phase 3 Subtotal		3060	58	141	199	160	99	259
Total Project Trips		9,480	228	497	725	559	380	939

- ITE land use category 210 – Single-Family Homes (Adj Streets, 7-9A, 4-6P):  
Daily: (T) = 9.44 (X)  
AM Peak Hour: T = 0.74(X); Enter = 25%; Exit = 75%  
PM Peak Hour: T = 0.99 (X); Enter = 63%; Exit = 37%
- ITE land use category 710 – Office (Adj Streets, 7-9A, 4-6P):  
Daily: (T) = 9.74 (X)  
AM Peak Hour: T = 1.16 (X); Enter = 86%; Exit = 14%  
PM Peak Hour: T = 1.15 (X); Enter = 16%; Exit = 84%
- Based on Observations of Fire Stations 9, 70 and 86 in Contra Costa County
- ITE land use category 252 - Senior Adult Housing - Attached (Adj Streets, 7-9A, 4-6P):  
Daily: (T) = 4.27 (X)  
AM Peak Hour: T = 0.24 (X); Enter = 33%; Exit = 67%  
PM Peak Hour: T = 0.30 (X); Enter = 61%; Exit = 39%

Source: *Trip Generation Manual* (10th Edition), ITE, 2019; Fehr & Peers, 2019

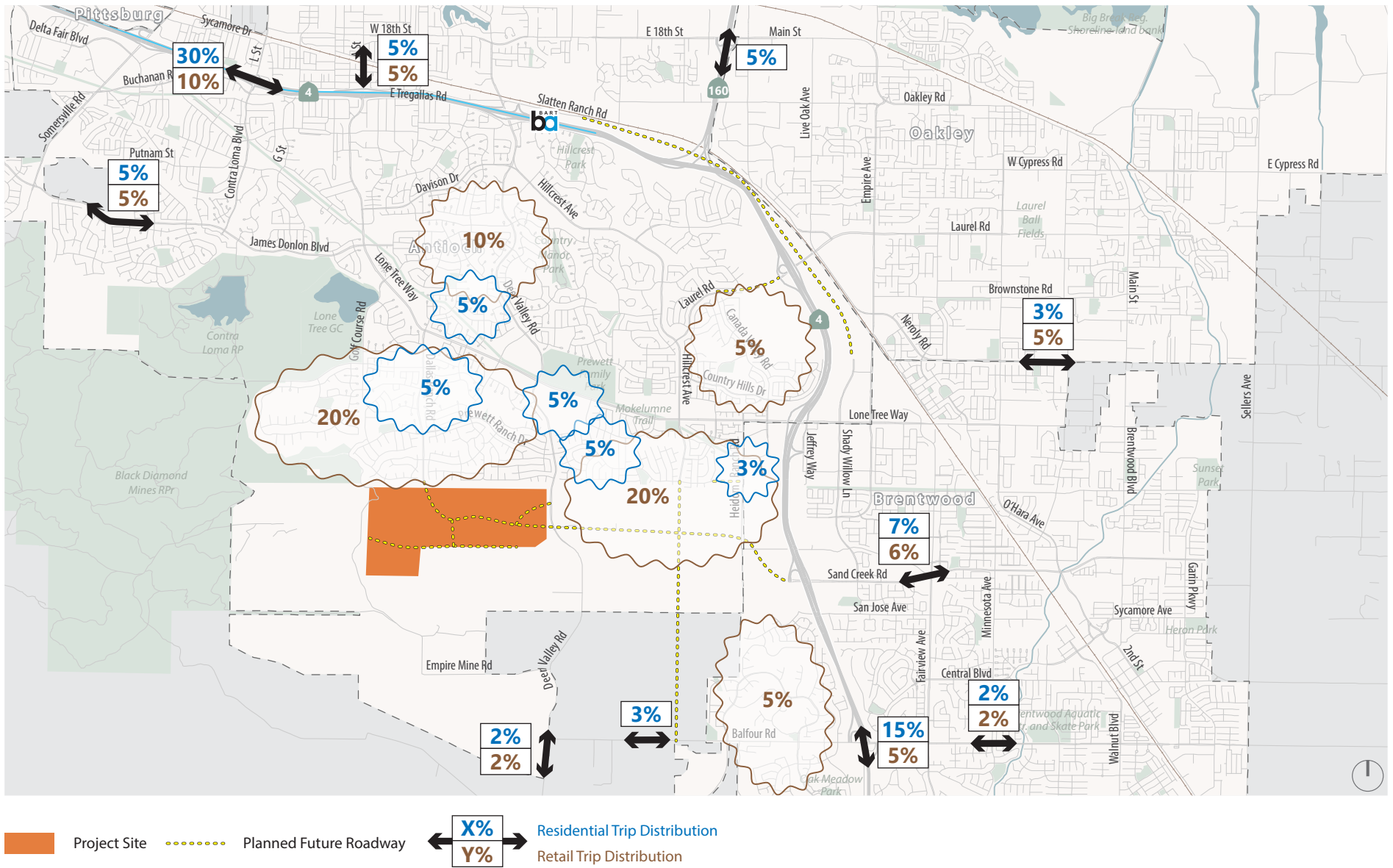
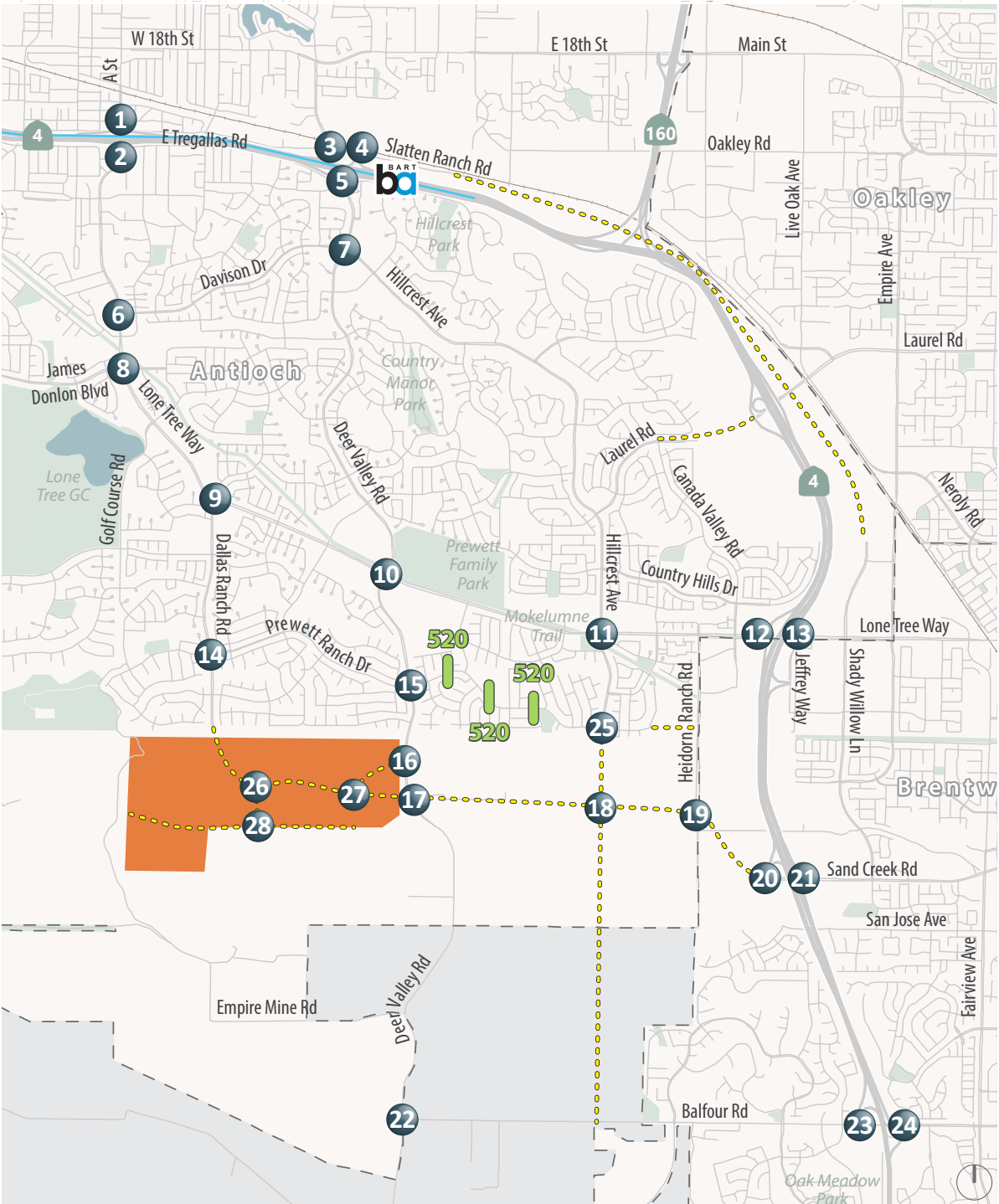


Figure 5

## Project Trip Distribution





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection Stop Sign

Project Site Planned Future Roadway Study Intersection

Future Intersection Daily Roadway Segment Volume

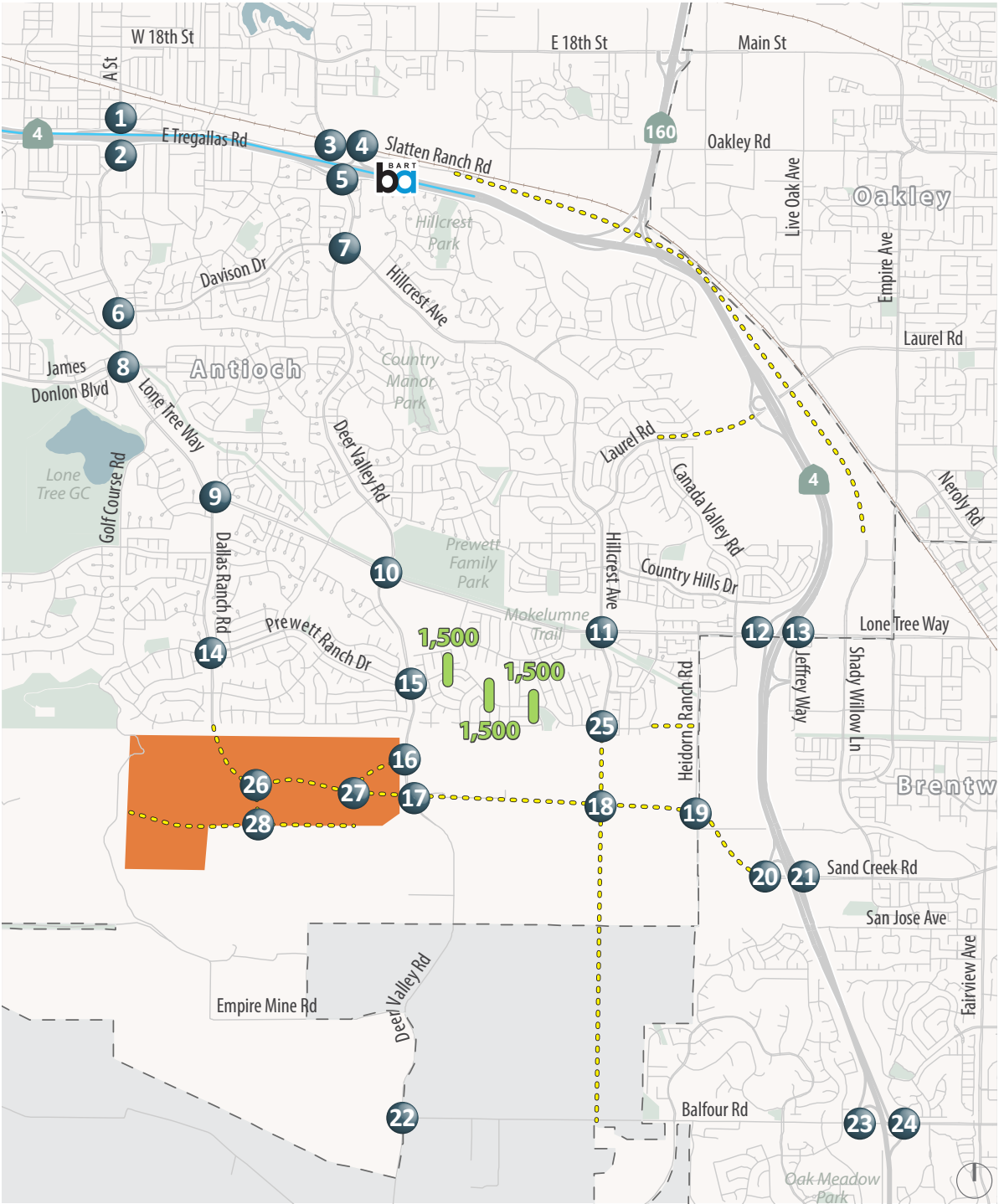


Figure 6

# Project Trip Assignment Existing Roadway Network







XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Planned Future Roadway

Study Intersection

Future Intersection

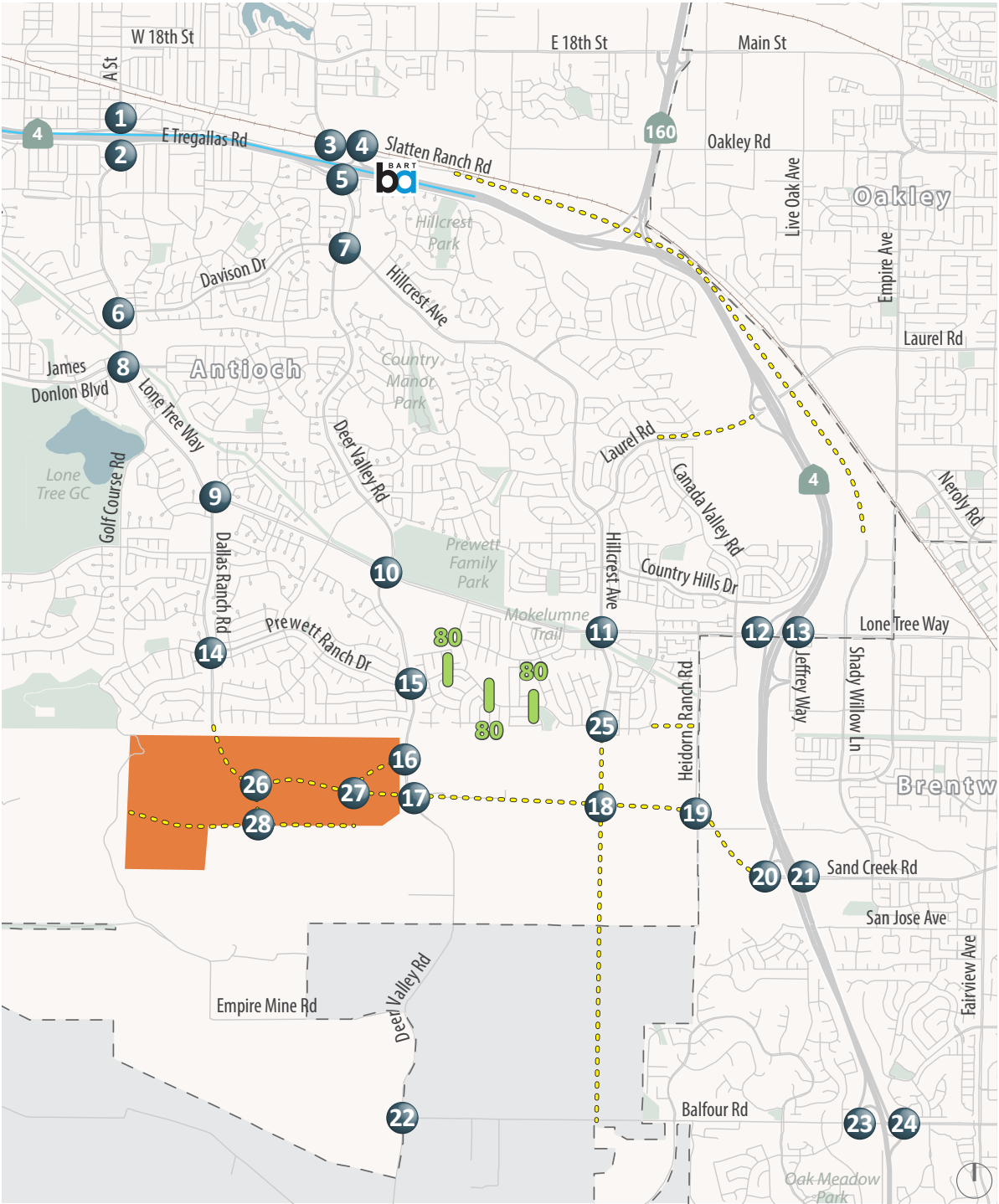
Daily Roadway Segment Volume



Figure 7

# Project Trip Assignment Near-Term Roadway Network





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign



Project Site



Planned Future Roadway



Study Intersection



Daily Roadway Segment Volume

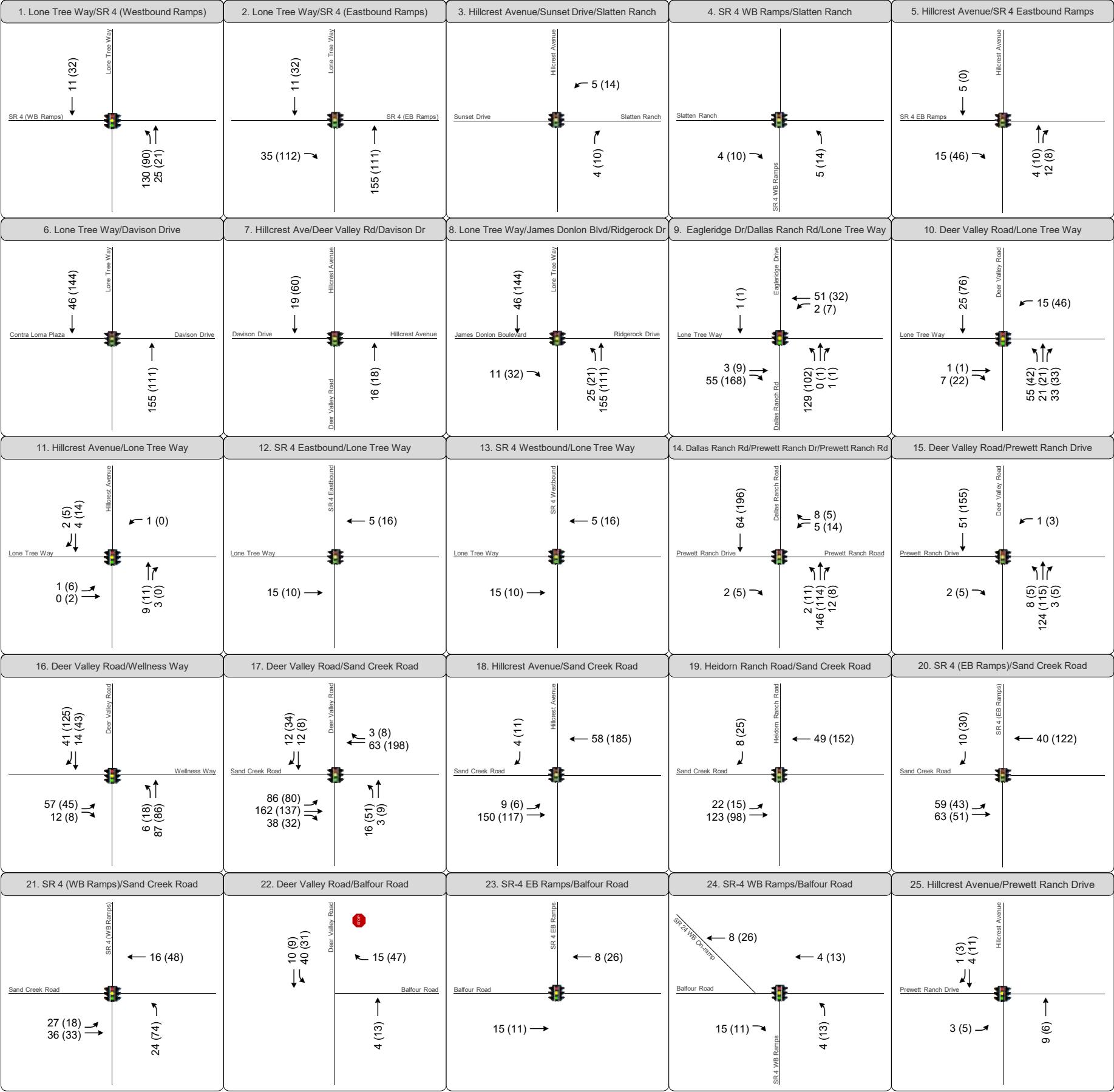


Figure 8

# Project Trip Assignment Cumulative Roadway Network



## 4. Existing with Project Conditions

This chapter evaluates potential off-site traffic impacts under Existing with Project conditions.

### Existing with Project Traffic Volumes

The project traffic volumes on **Figure 6** were added to the existing traffic volumes from **Figure 3** to estimate the Existing with Project traffic volumes, as shown on **Figure 9**. As part of the project, roadway improvements would be constructed to extend Sand Creek Road from Deer Valley Road to Dallas Ranch Road, and Deer Valley Road would be improved along the project frontage to provide two travel lanes in each direction through the Sand Creek Road intersection, where it would taper to a two-lane cross-section to the south. An assessment of on-site intersections is provided in the site plan review chapter.

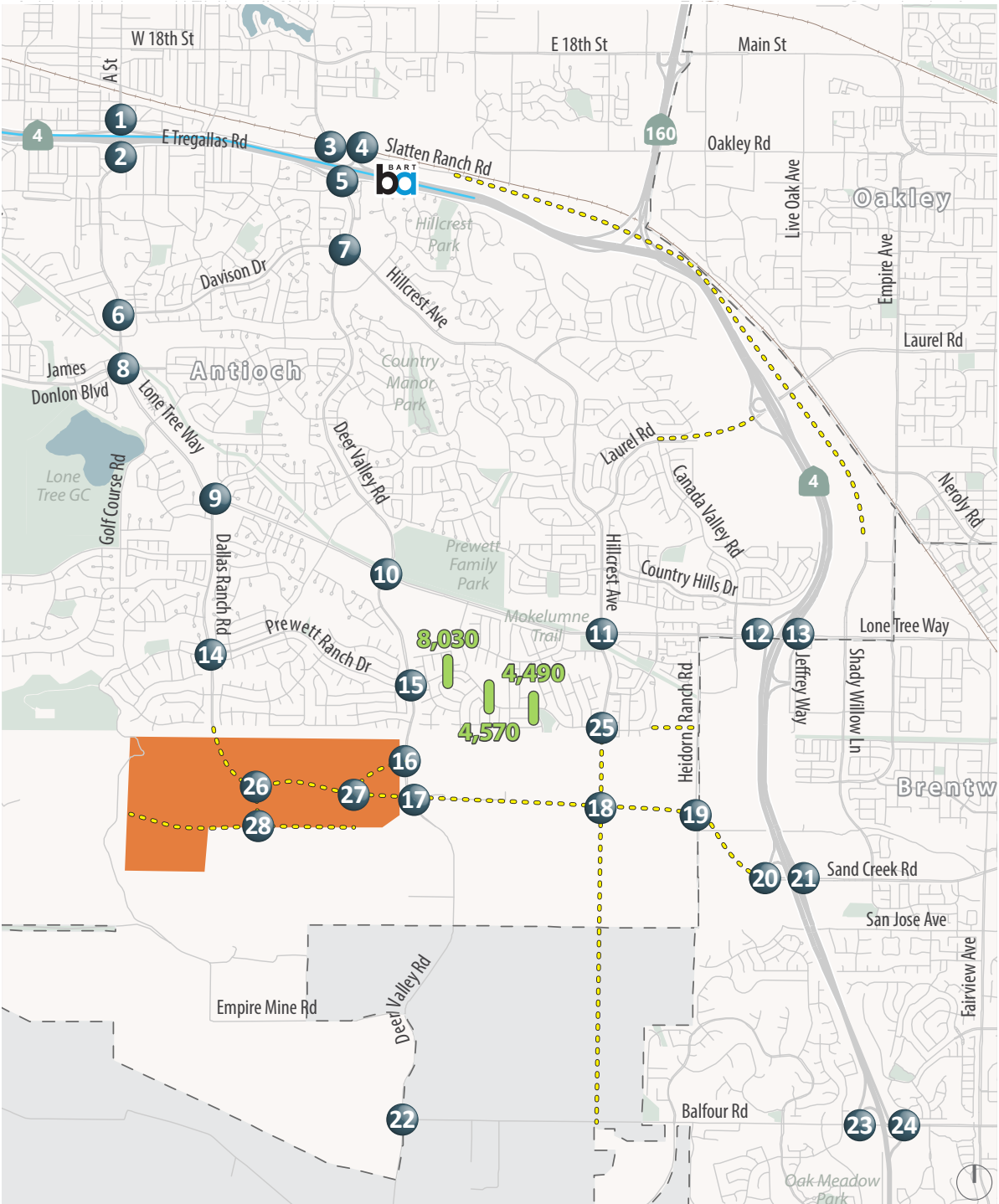
### Analysis of Existing with Project Conditions

#### Intersection Operations

Existing with Project intersection operations were evaluated using the same methods described in Chapter 1. The Existing with Project analysis results are presented in **Table 7**, based on the traffic volumes and intersection configurations presented on **Figure 9**. **Table 7** also includes the operations results for Existing conditions. The addition of project traffic would increase average delay at the signalized study intersections and would worsen already deficient operations at the Hillcrest Avenue at State Route 4 Eastbound Ramp intersection. No signalized intersections that are currently operating within the City's level of service standard are projected to degrade beyond the established level of service standard with the addition of project traffic in the existing condition.

Vehicle queues are expected to increase slightly with the addition of project traffic but would be generally contained within the available storage space. For signalized intersections that are projected to operate at LOS D or better during the morning and evening peak hours, it is expected that vehicle queue spillback can be managed through signal timing adjustments which the City of Antioch periodically undertakes to optimize travel flow along major corridors.





XX (YY)    AM (PM) Peak Hour Traffic Volumes    Signalized Intersection    Stop Sign

Project Site    Planned Future Roadway    Study Intersection

Future Intersection    Daily Roadway Segment Volume

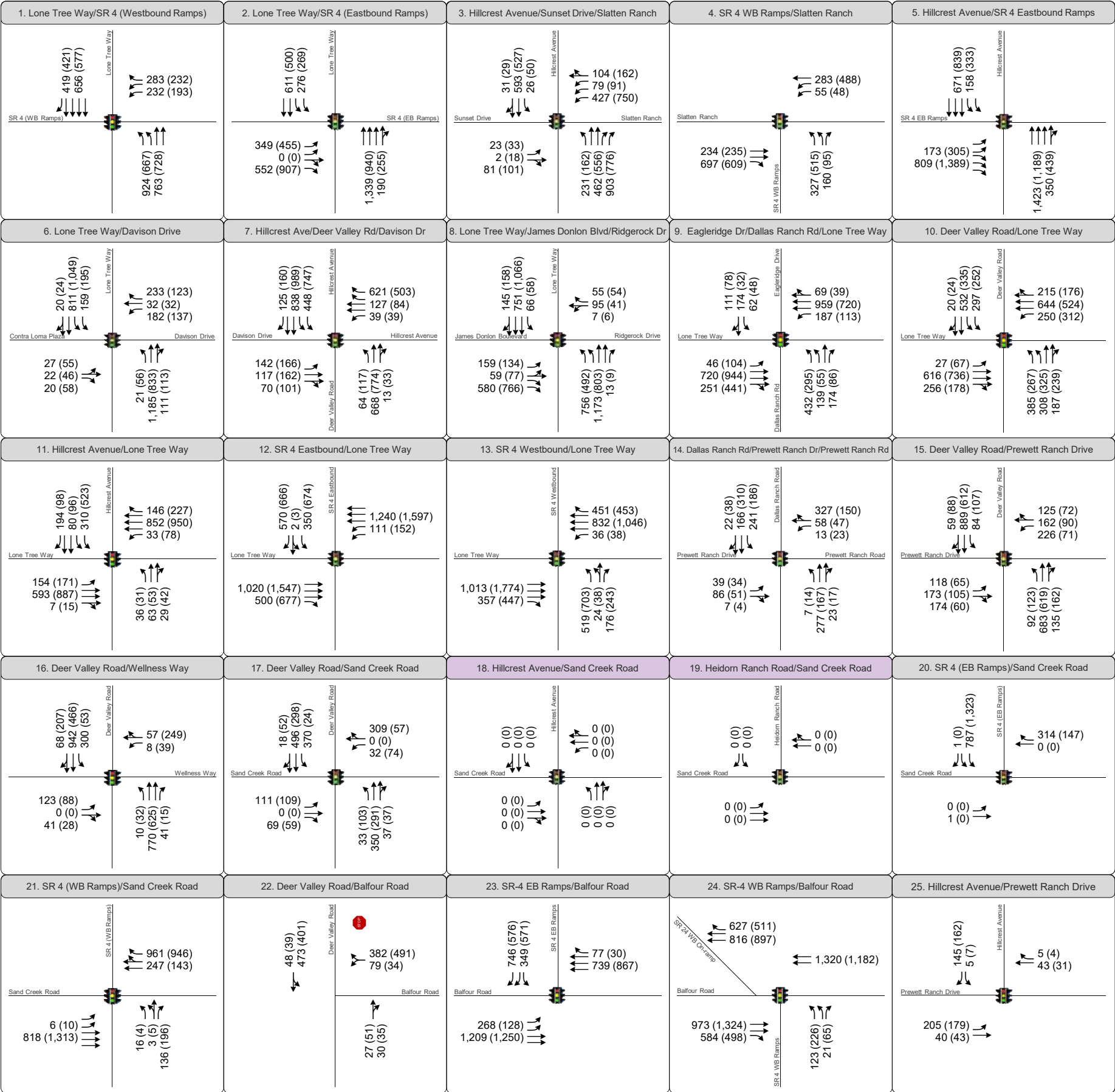


Figure 9  
Existing with Project Peak Hour  
Intersection Traffic Volumes, Lane Configurations and Traffic Controls

**Table 7: Existing With Project Conditions Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Existing		Existing with Project	
			Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS
1. Lone Tree Way/A Street/State Route 4 Westbound Ramps	Signal	AM PM	13 9	B A	14 9	B A
2. Lone Tree Way/A Street/State Route 4 Eastbound Ramps	Signal	AM PM	15 15	B B	17 17	B B
3. Hillcrest Avenue/Sunset Drive/Slatten Ranch Road	Signal	AM PM	18 17	B B	18 17	B B
4. Slatten Ranch Road/State Route 4 Westbound Ramps	Signal	AM PM	8 8	A A	8 8	A A
5. Hillcrest Avenue/State Route 4 Eastbound Ramps	Signal	AM PM	30 <b>90</b>	C <b>F</b>	30 <b>99</b>	C <b>F</b>
6. Lone Tree Way/Davison Drive	Signal	AM PM	17 15	B B	18 16	C B
7. Deer Valley Road/Hillcrest Avenue/Davison Drive	Signal	AM PM	26 29	C C	27 30	C C
8. Lone Tree Way/James Donlon Boulevard	Signal	AM PM	19 16	B B	20 17	B B
9. Lone Tree Way/Dallas Ranch Road	Signal	AM PM	27 16	C B	33 18	C C
10. Lone Tree Way/Deer Valley Road	Signal	AM PM	30 21	C C	36 26	D C
11. Lone Tree Way/Hillcrest Avenue	Signal	AM PM	19 20	B C	19 21	B C
12. Lone Tree Way/State Route 4 Eastbound Ramps	Signal	AM PM	17 32	B C	18 34	B C
13. Lone Tree Way/State Route 4 Westbound Ramps/Jeffery Way	Signal	AM PM	9 12	A B	9 13	A B
14. Prewett Ranch Drive/Dallas Ranch Road	Signal	AM PM	19 14	B B	20 14	B B
15. Prewett Ranch Drive/Deer Valley Road	Signal	AM PM	27 14	C B	30 15	C B
16. Deer Valley Road/Wellness Way/Street A	Signal	AM PM	7 5	A A	13 13	B B
17. Sand Creek Road/Deer Valley Road	Signal	AM PM	9 7	A A	11 8	B A
18. Sand Creek Road/Hillcrest Avenue (future intersection)	Signal	AM PM	-- --	-- --	-- --	-- --

**Table 7: Existing With Project Conditions Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Existing		Existing with Project	
			Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS
19. Sand Creek Road/Heidorn Ranch Road (future intersection)	Signal	AM PM	-- --	-- --	-- --	-- --
20. Sand Creek Road/State Route 4 Eastbound Ramps	Signal	AM PM	4 4	A A	4 4	A A
21. Sand Creek Road/State Route 4 Westbound Ramps	Signal	AM PM	5 6	A A	5 5	A A
22. Balfour Road/Deer Valley Road	SSSC	AM PM	14 (23) 11 (14)	B (C) B (B)	27 <b>(52)</b> 14 (22)	D <b>(F)</b> B (C)
23. Balfour Road/State Route 4 Eastbound Ramps	Signal	AM PM	33 30	C C	34 32	C C
24. Balfour Road/State Route 4 Westbound Ramps	Signal	AM PM	25 23	C C	25 22	C C
25. Prewett Ranch Drive at Hillcrest Avenue	Signal	AM PM	19 16	B B	21 17	C B

Notes: **Bold** indicates potentially deficient operations. ***Bold Italics*** indicates potentially significant impact.

1. Signal = signalized intersection; SSSC = side-street stop-controlled

2. Average intersection delay is calculated for all signalized intersections using the HCM 6<sup>th</sup> Edition method for vehicles.

Source: Fehr & Peers, 2019

At the Deer Valley Road at Balfour Road intersection, the addition of project traffic would result in LOS F conditions for the side-street movement, resulting in a potentially significant impact. Peak hour signal warrants would be satisfied with the addition of project traffic during the AM peak hour with Phase 1 development (phasing assessment presented in Chapter 7).

## Daily Roadway Segment Operation

As described in chapter 2, automatic machine traffic counts were conducted over a 72-hour period (Tuesday through Thursday) on clear days in August 2019 with area schools in session along Prewett Ranch Drive as some vehicle traffic accessing the site could travel through Prewett Ranch Drive to access Hillcrest Avenue and Sand Creek Road prior to the completion of the Sand Creek Road extension between Hillcrest Avenue and Deer Valley Road. To assess the effects of the addition of project traffic on Prewett Ranch Drive in the existing condition, the daily trip generation estimates were applied to the project trip assignment. The resulting trips were then added to the existing traffic volumes. The percent increase in project trips was also calculated, with the results presented in **Table 8**.

**Table 8: Existing With Project Conditions Average Daily Traffic**

Segment	Daily Traffic <sup>1</sup>	Project Traffic <sup>2</sup>	Existing With Project	Daily Fluctuation <sup>3</sup>	Project Increase
1. Prewett Ranch Drive, east of Deer Valley Road	7,510	520	8,030	± 1.2%	7%
2. Prewett Ranch Drive at Diablo Vista Elementary School	4,050	520	4,570	± 1.8%	13%
3. Prewett Ranch Drive, west of Hillcrest Avenue	3,970	520	4,490	± 2.9%	13%

Notes: 1. Average daily two-way traffic measured over three days.  
2. Average peak hour volume from the three weekdays of data collection.  
3. Percent difference between the three days of data collection.

Source: Fehr & Peers, 2019

For Segments 1 and 2, the Existing with Project daily traffic volumes are below the maximum desired level for a residential collector roadway without front-on housing. For Segment 3 between Grass Valley Way and Hillcrest Avenue, existing traffic volumes exceed the desired level for a residential collector roadway with front-on housing (3,000 vehicles per day), with the project expected to increase vehicle traffic by up to 13 percent.

## Construction Assessment

The assessment of construction activity typically considers construction vehicles (including vehicles removing or delivering fill material, bulldozers, and other heavy machinery, as well as building materials delivery) and construction worker activity. Additionally, during some phases of the project, some homes would be completed and occupied, adding project traffic to project construction traffic. As currently proposed, Phase 1 construction would commence in Summer 2021, with a target completion date of Fall 2023. Phase 2 construction is projected to start Spring 2024, with a target completion of Fall 2026, and Phase 3 is projected to start Spring 2027, with overall project completion in Fall of 2029.

Detailed information relating to the construction schedule during site development or a construction management plan is not available. As such, the potential transportation impacts during construction could be significant.

# Existing Conditions Impacts and Mitigation

Two potential off-site intersection impacts were identified in the existing condition. Additionally, there could be significant, although temporary, impacts during the construction phase of the project.

**Impact Statement 1:** Intersection 5 – Hillcrest Avenue at State Route 4 Eastbound Ramps

The Hillcrest Avenue at State Route 4 Eastbound Ramps intersection operates at a deficient LOS F during the PM peak hour prior to the addition of project traffic in the existing condition. The addition of project traffic would worsen operations and increase delay by nine seconds. Based on the significance criteria, this is considered a **significant** impact. As detailed in Chapter 7, this impact would occur with Phase 1 of the project. This interchange has been built to its ultimate right-of-way and no additional physical improvements are planned. Poor operations at this intersection are primarily due to the proximity of adjacent intersections that affect vehicle progression through the interchange area. As a result, adjusting the timing of the traffic signals would improve operations and allow increased travel through the interchange.

**Mitigation Measure 1:** The Project Applicant shall fund the design and installation of Adaptive Signal Control Technologies (ASCT) or other traffic signal interconnect system approved by the City at the following intersections:

- Slatten Ranch Road at State Route 4 Westbound Ramps
- Slatten Ranch Road/Sunset Drive at Hillcrest Avenue
- Hillcrest Avenue at State Route 4 Eastbound Ramps
- East Tregallas Road/Larkspur Drive at Hillcrest Avenue

Adaptive Signal Control Technologies can adjust traffic signal cycle lengths and phasing based on actual conditions with the ability to adjust signal timing parameters to best serve actual conditions every few minutes. Additional information about the technology can be found on the U.S. Department of Transportation Federal Highway Administration's website.<sup>10</sup>

In conjunction with the signal timing adjustments, the Project Applicant shall also work with the City and Caltrans to design and install potential restriping options within the Hillcrest Avenue at SR 4 interchange area that improve vehicle and bicycle travel through the interchange area.

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<sup>10</sup> [https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/pdf/asct\\_brochure.pdf](https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/pdf/asct_brochure.pdf)



The design process shall start prior to the issuance of the 10<sup>th</sup> residential building permit for the project, and installation of the traffic signal interconnect system and restriping shall be completed prior to the issuance of the 422<sup>nd</sup> building permit unless the City of Antioch Traffic Engineer determines that design and installation delays are beyond the control of the Project Applicant.

With signal timing adjustments to better serve projected traffic flows, intersection operations would improve to an acceptable level, reducing the impact to a **less-than-significant** level, as shown in **Table 9**.

Although the implementation of the above measures would reduce the impact to a less-than significant level, Caltrans controls the operations of the traffic signals at the Slatten Ranch Road at State Route 4 Westbound Ramps and Hillcrest Avenue at State Route 4 Eastbound Ramps intersection. Although Caltrans staff has indicated initial support for the striping changes and installation of traffic signal equipment to improve operations for all modes of travel through the interchange, the City cannot assure full implementation of this improvement and the impact would remain **significant and unavoidable** if Caltrans does not accept the improvements.

**Impact Statement 2:** Intersection 22 – Balfour Road at Deer Valley Road

The addition of project-generated vehicle trips during the AM peak hour would result in LOS F conditions for side-street movements and would result in peak hour signal warrants being satisfied in the existing condition. Based on the significance criteria, this is considered a **significant** impact. As detailed in Chapter 7, this impact would occur with Phase 2 of the project.

**Mitigation Measure 2:** The Project Applicant shall install a traffic signal at this intersection in conjunction with other planned improvements, including the construction of a southbound left-turn lane, as well as separate westbound left and right-turn lanes. Improvements shall be completed prior to the issuance of the 431<sup>st</sup> residential building permit.

These improvements would result in overall acceptable service levels, reducing the project's impact to a **less-than-significant** level, as shown in **Table 9**, because the Project Applicant would construct the improvements. The responsibility for improvements to this intersection are shared by the City of Antioch and the City of Brentwood. Therefore, a reimbursement agreement with the City of Brentwood for half the signal costs and the cost of all improvements on Balfour Road could be sought. Although the Project Applicant would be required to make the improvement, the impact could remain **significant and unavoidable** if either the City of Brentwood or Contra Costa County do not approve/accept the improvements.

**Table 9: Existing with Project with Mitigation Conditions Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Existing		Existing with Project		Existing with Project with Mitigation	
			Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS
5. Hillcrest Avenue/SR 4 Eastbound Ramps	Signal	AM PM	32 <b>90</b>	C <b>F</b>	32 <b>99</b>	C <b>F</b>	32 44	C D
22. Balfour Road/Deer Valley Road	SSSC/ Signal	AM PM	14 (23) 11 (14)	B (C) B (B)	27 ( <b>52</b> ) 14 (22)	D ( <b>F</b> ) B (C)	8 7	A A

Notes: **Bold** indicates potentially deficient operations. **Bold Italics** indicates potentially significant impact.

1. Signal = signalized intersection; SSSC = side-street stop-controlled

2. Average intersection delay is calculated for all signalized intersections using the HCM 6<sup>th</sup> Edition method for vehicles.

Source: Fehr & Peers, 2019

**Impact Statement 3:** Construction related activities could create potential conflicts with other roadway users, such as construction related activities resulting in lane closures along the project frontage, construction vehicles queuing within the public right-of-way waiting for entry to the site, construction worker parking in non-designated parking areas, or construction debris on public streets. Construction traffic impacts would be temporary in nature; however, this impact is considered **potentially significant** because full buildout of the site could span up to eight years.

**Mitigation Measure 3:** Although construction traffic impacts would be temporary, preparation of a construction vehicle impact assessment and development of a construction traffic management plan to be submitted as part of the final improvement plans would reduce the potential for construction vehicle conflicts with other roadway users. The plan should include:

- Project staging plan to maximize on-site storage of materials and equipment;
- A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak hours; lane closure proceedings; signs, cones, and other warning devices for drivers; and designation of construction access routes;
- Permitted construction hours;
- Location of construction staging;
- Identification of parking areas for construction employees, site visitors, and inspectors, including on-site locations; and
- Provisions for street sweeping to remove construction related debris on public streets.

Implementation of the construction traffic management plan would reduce the temporary construction traffic impact to a **less-than-significant** level.

## 5. Near-Term Traffic Conditions

The near-term scenario reflects existing traffic counts plus traffic from approved and pending developments that are expected to be completed and occupied in the next five to ten years. Near-term conditions without and with the project are evaluated. It also includes transportation projects programmed for implementation in the near-term horizon, and construction of required transportation mitigation measures for approved projects, as the traffic generated by those projects is considered in this scenario. The analysis of cumulative conditions (see Chapter 6 for details) considers development within the City of Antioch as described in the General Plan and approved General Plan Amendment.

### Near-Term Forecasts

The available *City of Brentwood Project Status Report* (May 2019) and *City of Antioch Project Pipeline* (as of January 2019) at the time the project's Notice of Preparation (NOP) was issued were reviewed to identify developments to include in this scenario. Copies of these reports are provided in **Appendix D**. Developments that could generate additional traffic through the study area are summarized in **Table 10** and their locations shown on **Figure 10**.

Near-Term project vehicle trip generation was estimated using trip generation rates and equations for the proposed land uses from ITE's *Trip Generation Manual* (10th Edition). The results are provided in **Appendix E**. Traffic generated by approved and pending developments was added to the existing traffic volumes to provide the basis for the Near-Term without Project analysis, as presented on **Figure 11**. The existing traffic counts were also increased by five percent to account for traffic growth from projects outside the immediate study area that could add through traffic to the area. Project traffic volumes from **Figure 7** were added to the Near-Term without Project forecasts to estimate Near-Term with Project volumes at the study intersections, as presented on **Figure 12**.

**Table 10: Approved Projects Summary**

Map Location	Project Name	Size	Land Use	Status
1	Park Ridge, Antioch	525 dwelling units	Single Family Homes	Approved, under construction
2	Heidorn Village, Antioch	117 dwelling units	Single Family Homes	Approved, under construction
3	Aviano, Antioch	533 dwelling units	Single Family Homes	Approved, under construction
4	Promenade - Vineyards at Sand Creek, Antioch	641 dwelling units	Single Family Homes	Approved, under construction
5	Laurel Ranch, Antioch	180 dwelling units; 10 acres commercial	Single Family Homes	Approved
6	Wildflower Station, Antioch	22 single-family 98 Condos 89,400 square feet commercial	Mixed-Use	Approved
7	Parkside Villas, Brentwood	37 dwelling units	Single Family Homes	Approved
8	Bridle Gate Residential Elementary School, Brentwood	265 dwelling units 700 students	Single Family Homes Elementary School	Pending Pending
8	Bridle Gate Commercial, Brentwood	150,000 square feet	Shopping Center	Pending
8	The Enclave, Brentwood	258 dwelling units	Apartments	Pending
9	Brentwood Country Club, Brentwood	63 dwelling units 123-units	Detached Age-Restricted Residential Care Facility	Approved
10	Orfanos, Brentwood	160 dwelling units	Single Family Homes	Approved
11	Alvarez Partners, Brentwood	48 dwelling units	Single Family Homes	Approved
12	Streets of Brentwood, Brentwood	320 dwelling units 32,000 square feet	Apartments Shopping Center	Pending
13	Shops at Lone Tree Village, Brentwood	54,000 square feet	Shopping Center	Under Construction
14	Quail Cove	32 dwelling units	Single Family Homes	Approved

Source: *City of Brentwood Project Status Report* (as of May 2019) and *City of Antioch Project Pipeline* (January 2019)

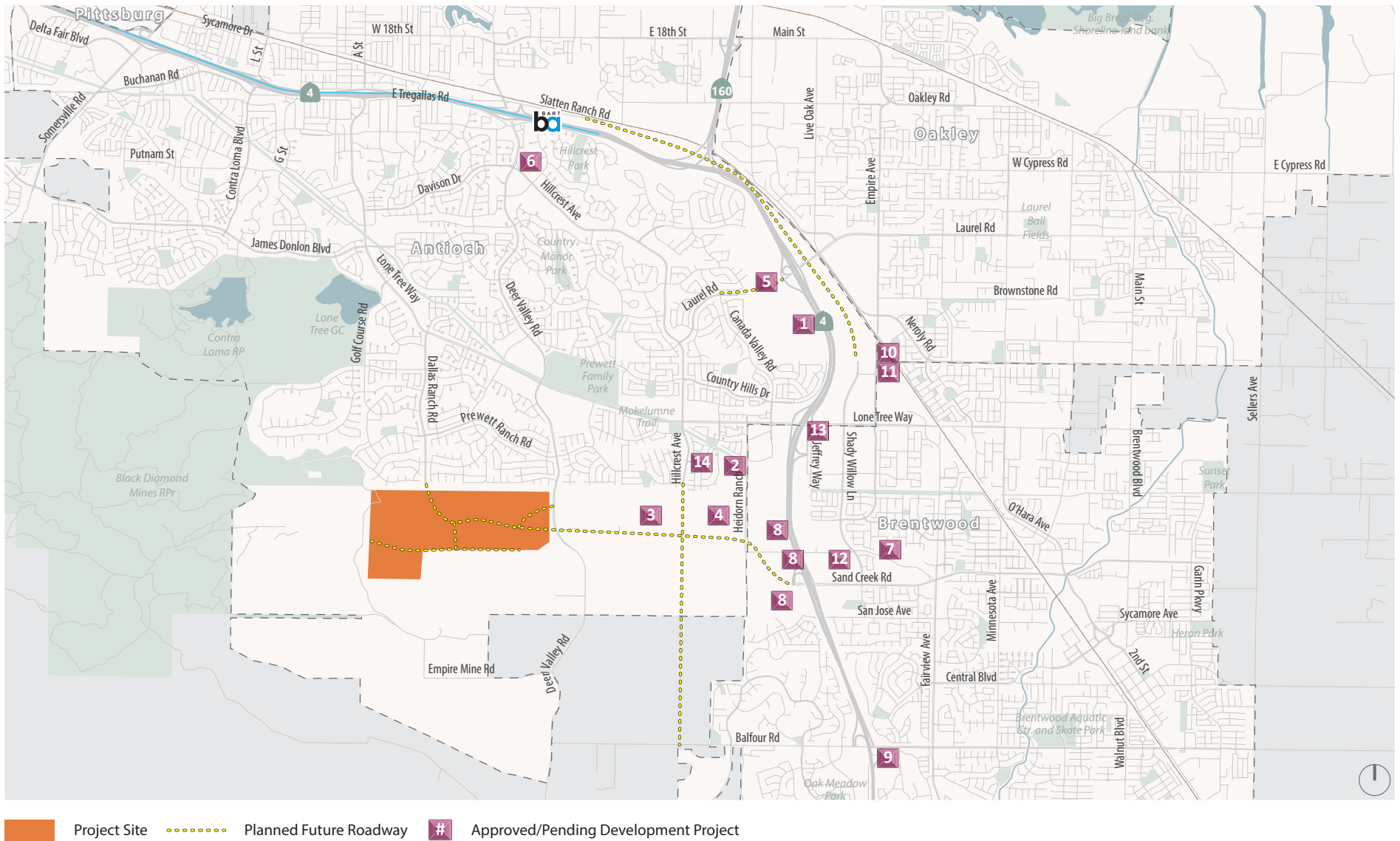
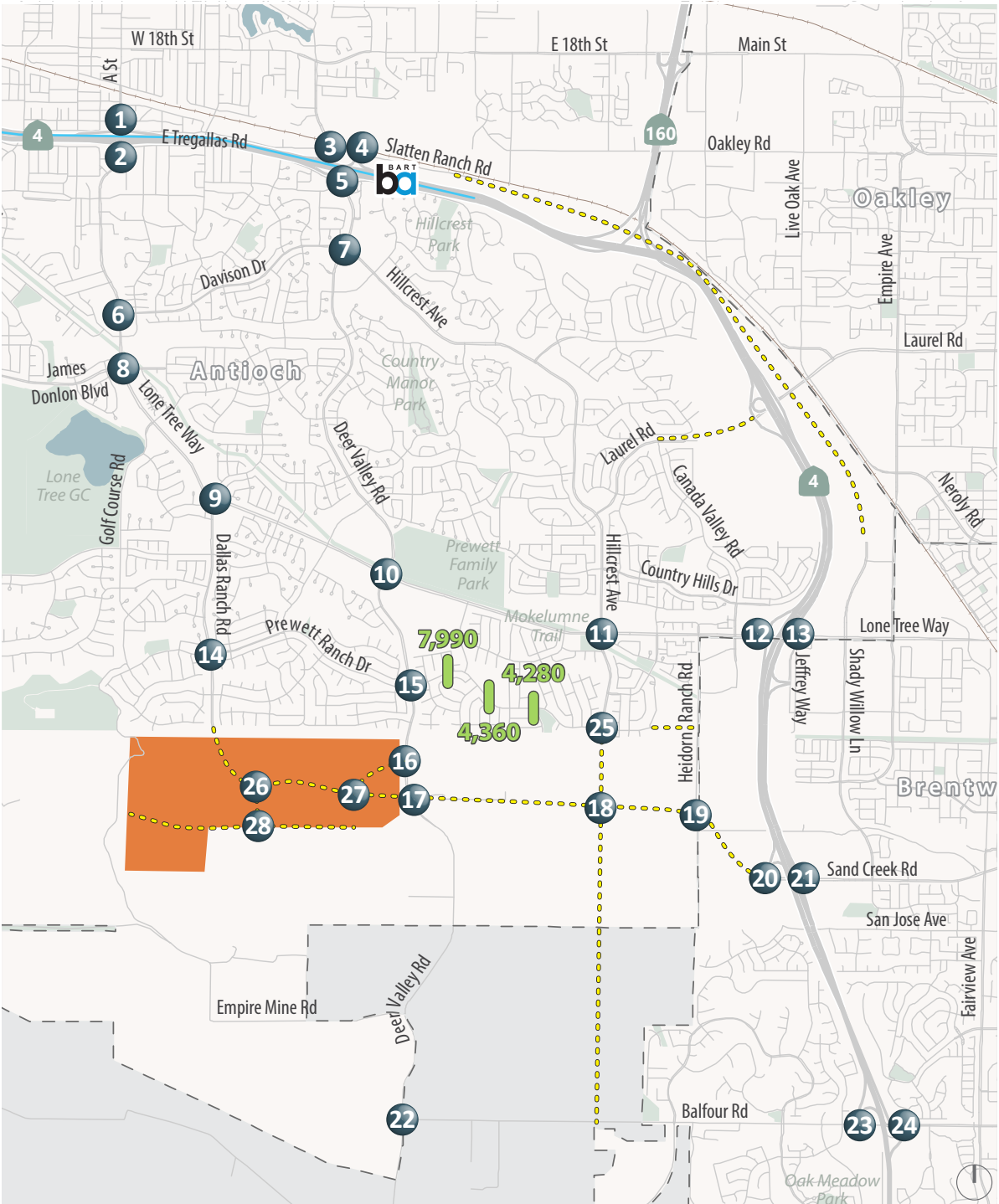


Figure 10

## Approved and Pending Project Locations





XX (YY) AM (PM) Peak Hour Traffic Volumes  
Signalized Intersection  
Stop Sign  
Project Site  
Planned Future Roadway  
Study Intersection  
Daily Roadway Segment Volume



Figure 11  
Near-Term without Project Peak Hour  
Intersection Traffic Volumes, Lane Configurations and Traffic Controls

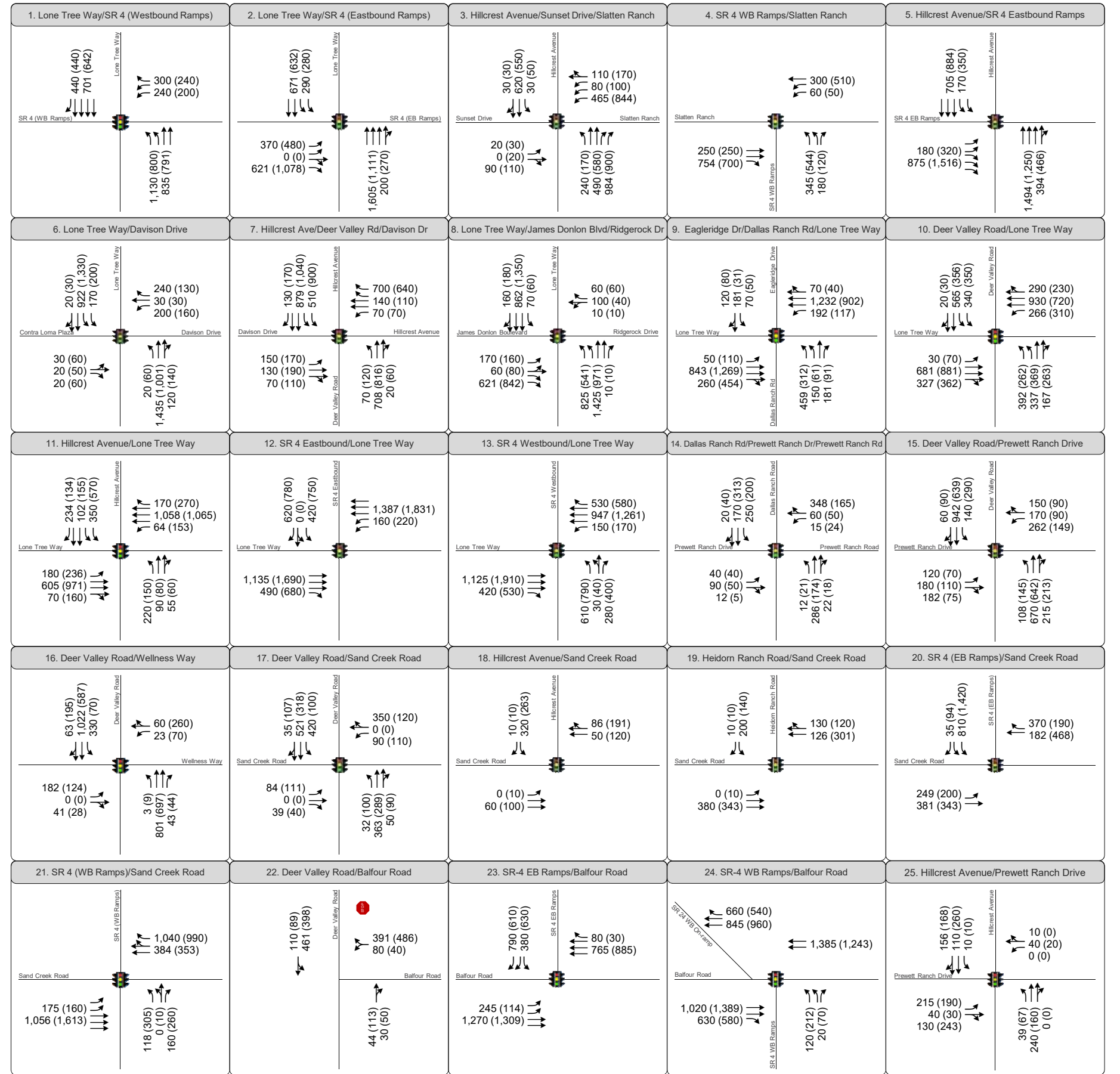
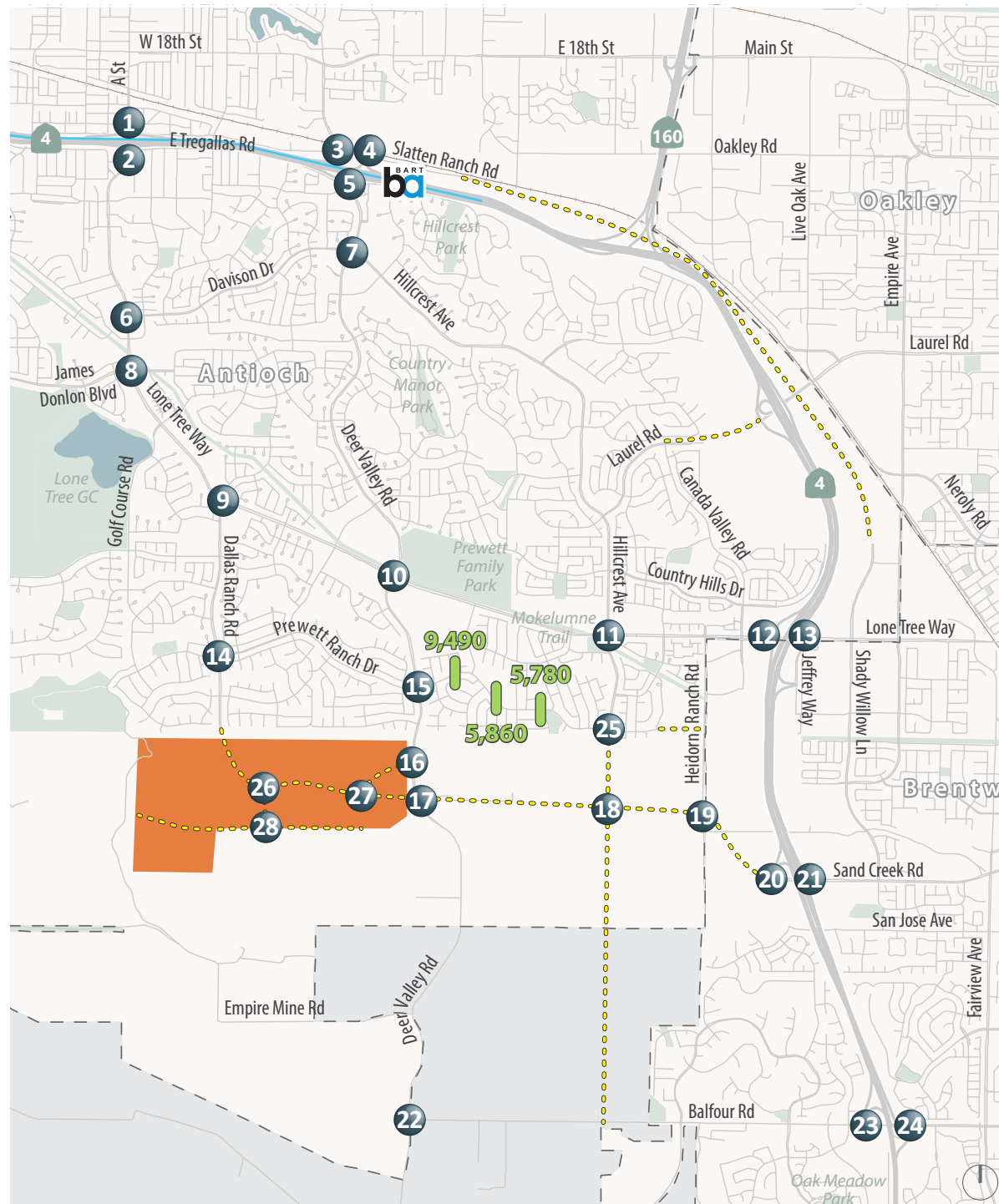


Figure 12

## Near-Term with Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls



## Near-Term Roadway Assumptions

Several roadway improvements are conditioned on near-term developments and considered in the near-term forecasts, including:

- Extension of Hillcrest Avenue from its current terminus to an extension of Sand Creek Road
- Improvements to Heidorn Ranch Road along the frontage of the Vineyards at Sand Creek (Promenade) project and Heidorn Village Project
- Extension of Sand Creek Road from State Route 4 in the east to a new terminus by the Dozier-Libbey Medical High School (no change to the existing high school access is assumed in the near-term condition, with all access assumed to continue through Sand Creek Road to the west of the campus, adjacent to the Kaiser Hospital facility)
- Extension of Laurel Road from State Route 4 to its current terminus east of Canada Valley Road
- Extension of Prewett Ranch Drive to Heidorn Ranch Road

For the extension of Sand Creek Road, no direct through travel would be permitted between Deer Valley Road and Hillcrest Avenue; however, vehicles would be able to travel through Prewett Ranch Drive between Hillcrest Avenue and Heidorn Ranch Road to access destinations to the east.

As part of the project, roadway improvements would be constructed to extend Sand Creek Road from Deer Valley Road to Dallas Ranch Road, and Deer Valley Road would be improved along the project frontage to provide two travel lanes in each direction through the Sand Creek Road intersection, where it would taper to a two-lane cross-section. An assessment of on-site intersections is provided Chapter 9.

## Analysis of Near-Term Conditions

### Intersection Operations

Near-Term without and with Project conditions were evaluated using the same methods described in Chapter 1. The analysis results are presented in **Table 11**, based on the traffic volumes and lane configurations presented on **Figure 11** and **Figure 12**. In the near-term condition, the Hillcrest Avenue at State Route 4 Eastbound Ramp and Lone Tree Way at SR 4 Eastbound Ramp would operate at deficient levels prior to the addition of project traffic. All other study intersection would operate at acceptable service levels prior to the addition of project traffic.



**Table 11: Near-Term Conditions Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Near-Term without Project		Near-Term with Project	
			Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS
1. Lone Tree Way/A Street/State Route 4 Westbound Ramps	Signal	AM PM	16 10	B A	19 10	B B
2. Lone Tree Way/A Street/State Route 4 Eastbound Ramps	Signal	AM PM	19 19	B B	21 22	C C
3. Hillcrest Avenue/Sunset Drive/Slatten Ranch Road	Signal	AM PM	16 18	B B	16 18	B B
4. Slatten Ranch Road/State Route 4 Westbound Ramps	Signal	AM PM	8 9	A A	8 9	A A
5. Hillcrest Avenue/State Route 4 Eastbound Ramps	Signal	AM PM	46 <b>121</b>	D <b>F</b>	50 <b>133</b>	D <b>F</b>
6. Lone Tree Way/Davison Drive	Signal	AM PM	20 17	C B	24 18	C B
7. Deer Valley Road/Hillcrest Avenue/Davison Drive	Signal	AM PM	31 45	C D	32 46	C D
8. Lone Tree Way/James Donlon Boulevard	Signal	AM PM	21 18	C B	22 20	C B
9. Lone Tree Way/Dallas Ranch Road	Signal	AM PM	30 17	C B	38 19	D B
10. Lone Tree Way/Deer Valley Road	Signal	AM PM	35 27	C C	40 33	D C
11. Lone Tree Way/Hillcrest Avenue	Signal	AM PM	43 34	D C	46 36	D D
12. Lone Tree Way/State Route 4 Eastbound Ramps	Signal	AM PM	24 <b>56.7</b>	C <b>E</b>	24 <b>57.4</b>	C <b>E</b>
13. Lone Tree Way/State Route 4 Westbound Ramps/Jeffery Way	Signal	AM PM	12 21	B C	12 21	B C
14. Prewett Ranch Drive/Dallas Ranch Road	Signal	AM PM	19 15	B B	21 14	C B
15. Prewett Ranch Drive/Deer Valley Road	Signal	AM PM	34 17	C B	43 24	D C
16. Deer Valley Road/Wellness Way/Street A <sup>3</sup>	Signal	AM PM	6 5	A A	15 15	B B
17. Sand Creek Road/Deer Valley Road <sup>3</sup>	Signal	AM PM	9 7	A A	11 9	B A
18. Sand Creek Road/Hillcrest Avenue	Signal	AM PM	5 5	A A	6 6	A A

**Table 11: Near-Term Conditions Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Near-Term without Project		Near-Term with Project	
			Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS
19. Sand Creek Road/Heidorn Ranch Road	Signal	AM PM	17 21	B C	18 22	B C
20. Sand Creek Road/State Route 4 Eastbound Ramps	Signal	AM PM	10 14	A B	11 25	B C
21. Sand Creek Road/State Route 4 Westbound Ramps	Signal	AM PM	7 9	A A	7 9	A A
22. Balfour Road/Deer Valley Road	SSSC	AM PM	18 (33) 12 (21)	C (D) B (C)	34 <b>(71)</b> 20 <b>(37)</b>	D <b>(F)</b> B <b>(E)</b>
23. Balfour Road/State Route 4 Eastbound Ramps	Signal	AM PM	32 31	C C	33 32	C C
24. Balfour Road/State Route 4 Westbound Ramps	Signal	AM PM	24 21	C C	24 21	C C
25. Prewett Ranch Drive/Hillcrest Avenue	Signal	AM PM	20 15	C B	27 18	C B

Notes: **Bold** indicates potentially deficient operations. **Bold Italics** indicates potentially significant impact.

1. Signal = signalized intersection; SSSC = side-street stop-controlled

2. Average intersection delay is calculated for all signalized intersections using the HCM 6<sup>th</sup> Edition method for vehicles.

3. Traffic signal timings optimized in "with project" conditions to better accommodate changed geometry.

Source: Fehr & Peers, 2019

Peak hour signal warrants would be met at the Balfour Road at Deer Valley Road intersection in the near-term condition prior to the addition of project traffic due to traffic growth from approved and pending projects. With the addition of project traffic, operations of the two deficient intersections would further degrade, and operations of the side-street movement at the Deer Valley Road at Balfour Road intersection would degrade from acceptable to unacceptable. All other study intersection would operate at acceptable service levels with the addition of project traffic.

Vehicle queues are expected to increase at study intersections as traffic volumes increase, which would further increase with the addition of project traffic. Monitoring and adjusting traffic signal timings in response to actual traffic volumes to minimize the potential for vehicle queue spillback is recommended.

## Daily Roadway Segment Operation

Traffic from near-term projects was added to the existing daily traffic volumes on Prewett Ranch Drive, with the resulting volumes shown in **Table 12**. Project trips that could use the roadway were then estimated

considering the changes to the roadway network in the near-term condition discussed previously and added to the Near-term without Project volumes. The percent increase in project trips was also calculated, with the results presented in **Table 12**.

**Table 12: Near-Term Conditions Average Daily Traffic**

Segment	Near-term Without Project Daily Traffic <sup>1</sup>	Project Traffic <sup>2</sup>	Near-term With Project	Existing Daily Fluctuation <sup>3</sup>	Project Increase
1. Prewett Ranch Drive, east of Deer Valley Road	7,990	1,500	9,490	± 1.2%	19%
2. Prewett Ranch Drive at Diablo Vista Elementary School	4,360	1,500	5,860	± 1.8%	34%
3. Prewett Ranch Drive, west of Hillcrest Avenue	4,280	1,500	5,780	± 2.9%	35%

Notes: 1. Average daily two-way traffic measured over three days.  
2. Average peak hour volume from the three weekdays of data collection.  
3. Percent difference between the three days of data collection.

Source: Fehr & Peers, 2019

For Segments 1 and 2, the near-term daily traffic volumes considering the addition of project traffic are below the maximum desired level for a residential collector roadway without front-on housing. For Segment 3 between Grass Valley Way and Hillcrest Avenue, existing traffic volumes exceed the desired level for a residential collector roadway with front-on housing (3,000 vehicles per day). In the Near-Term condition, volumes are expected to further increase and the addition of project traffic would further add vehicle travel to the roadway, with the project expected to increase traffic volumes on this roadway segment more than the existing daily fluctuation.

## Near-Term Conditions Impacts and Mitigation

Three potential off-site intersection impacts were identified in the Near-Term condition.

**Impact Statement 4:** Intersection 5 – Hillcrest Avenue at State Route 4 Eastbound Ramps

The Hillcrest Avenue at State Route 4 Eastbound Ramps intersection operates at a deficient LOS F during the evening peak hour prior to the addition of project traffic in the Near-Term condition. The addition of project traffic would worsen operations and increase average delay by 12 seconds. Based on the significance criteria, this is considered a **significant** impact. As detailed in Chapter 7, this impact would occur with project Phase 1. This interchange has been built to its ultimate right-of-way and no additional physical improvements are planned. Poor operations at this intersection are primarily due to the proximity of adjacent intersections that affect vehicle progression through the interchange area. As a result, adjusting the timing of the traffic signals would improve operations and allow increased travel through the interchange.

**Mitigation Measure 4:** The Project Applicant shall fund the design and installation of Adaptive Signal Control Technologies (ASCT) or other traffic signal interconnect system approved by the City at the following intersections (same as Mitigation Measure 1):

- Slatten Ranch Road at State Route 4 Westbound Ramps
- Slatten Ranch Road/Sunset Drive at Hillcrest Avenue
- Hillcrest Avenue at State Route 4 Eastbound Ramps
- East Tregallas Road/Larkspur Drive at Hillcrest Avenue

In conjunction with the signal timing adjustments, the Project Applicant shall also work with the City and Caltrans to design and install potential restriping options within the Hillcrest Avenue at SR 4 interchange area that improve vehicle and bicycle travel through the interchange area.

The design process shall start prior to the issuance of the 10<sup>th</sup> residential building permit for the project, and installation of the traffic signal interconnect system and restriping shall be completed prior to the issuance of the 422<sup>nd</sup> building permit unless the City of Antioch Traffic Engineer determines that design and installation delays are beyond the control of the Project Applicant.

As other projects would benefit from this improvement, a reimbursement agreement could be established by the Applicant with the City of Antioch. During the PM peak hour in the Near-term condition, project traffic represents 1.8 percent of the traffic flow, other near-term growth represents 5.9 percent of traffic flow, and existing traffic represents 92.3 percent of traffic flow.

With signal timing adjustments to better serve projected traffic flows, intersection operations would improve to LOS D during the PM peak hour, reducing the impact to a **less-than-significant** level, as shown in **Table 13**.

Although the implementation of the above measures would reduce the impact to a **less-than-significant** level, Caltrans controls the operations of the traffic signals at the Slatten Ranch Road at



State Route 4 Westbound Ramps and Hillcrest Avenue at State Route 4 Eastbound Ramps intersection. Although Caltrans staff has indicated initial support for the striping changes and installation of traffic signal equipment to improve operations for all modes of travel through the interchange, the City cannot assure full implementation of this improvement and the impact would remain **significant and unavoidable** if Caltrans does not accept the improvements.

**Impact Statement 5:** Intersection 12 – Lone Tree Way at State Route 4 Eastbound Ramps

The Lone Tree Way at State Route 4 Eastbound Ramps intersection is projected to operate at a deficient LOS E in the PM peak hour prior to the addition of project traffic in the near-term condition. The project would increase traffic through this intersection, and would increase average delay from 56.7 seconds to 57.4 seconds. Based on the significance criteria, this is considered a **significant** impact. As detailed in Chapter 7, this impact would occur with Phase 1 of the project in the Near-term condition.

**Mitigation Measure 5:** Improvements at this interchange are programmed in the East Contra Costa Regional Fee and Financing Authority (ECCRFFA) regional fee program, although specific improvements or the timing of their installation have not yet been identified. Fees are based on the land use type and are payable at the time building permits are issued based on either the number of dwelling units for residential uses or square-footage for non-residential uses, as established through a nexus study. The Project Applicant shall pay its fair share towards potential improvements at this intersection through participation in the ECCRFFA regional fee program.

Potential improvements under consideration include optimization of the signal timing or widening of the southbound off-ramp to provide a second southbound right-turn only lane. These improvements would result in overall acceptable service levels, reducing the project's impact to a **less-than-significant** level, as shown in **Table 13** (effects of signal timing shown in **Table 13**). However, payment of fees cannot assure that the improvement would be implemented when the impact occurs; therefore, the impact would remain **significant and unavoidable** until improvements are implemented.

**Impact Statement 6:** Intersection 22 – Balfour Road at Deer Valley Road

The addition of project-generated vehicle trips during the AM peak hour would result in LOS F conditions for the side-street movement; peak hour signal warrants would be satisfied prior to the addition to project traffic. Based on the significance criteria, this is considered a **significant** impact. As detailed in Chapter 7, this impact would occur with Phase 1 of the project.

**Mitigation Measure 6:** Implement Mitigation Measure 2. The Project Applicant shall install a traffic signal at this intersection in conjunction with other planned improvements, including the

construction of a southbound left-turn lane, as well as separate westbound left and right-turn lanes. Improvements shall be completed prior to the issuance of the 431<sup>st</sup> residential building permit

These improvements would result in overall acceptable service levels, reducing the project's impact to a **less-than-significant** level, as shown in **Table 13**, because the Project Applicant would construct the improvements. The responsibility for improvements to this intersection are shared by the City of Antioch and the City of Brentwood. Therefore, a reimbursement agreement with the City of Brentwood for half the signal costs and the cost of all improvements on Balfour Road could be sought. Although the Project Applicant would be required to make the improvement, the impact could remain **significant and unavoidable** if either the City of Brentwood or Contra Costa County do not approve/accept the improvements.

**Table 13: Near-Term With Project With Mitigation Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Near-term Without Project		Near-Term with Project with Mitigation		Near-Term with Project with Mitigation	
			Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS
5. Hillcrest Avenue/SR 4 Eastbound Ramps	Signal	AM	32	C	46	D	39	D
		PM	<b>99</b>	<b>F</b>	<b>121</b>	<b>F</b>	38	D
12. Lone Tree Way/State Route 4 Eastbound Ramps	Signal	AM	24	C	24	C	24	C
		PM	<b>57</b>	<b>E</b>	<b>57</b>	<b>E</b>	53	D
22. Balfour Road/Deer Valley Road	SSSC/Signal	AM	18 (33)	C (D)	34 ( <b>71</b> )	D ( <b>F</b> )	8	A
		PM	12 (21)	B (C)	20 ( <b>37</b> )	B ( <b>E</b> )	7	A

Notes: **Bold** indicates potentially deficient operations. **Bold Italics** indicates potentially significant impact.

1. Signal = signalized intersection; SSSC = Side-street Stop-Control

2. Average intersection delay is calculated for all signalized intersections using the HCM 6<sup>th</sup> Edition method for vehicles.

Source: Fehr & Peers, 2019



## 6. Cumulative Traffic Conditions

This chapter discusses Cumulative traffic conditions both without and with the project. The future condition analysis considers development within the City of Antioch as described in the General Plan, as well as development in Brentwood given that some study intersections are close proximity to the Brentwood/Antioch border.

### Cumulative Traffic Forecasts

To assess future growth with planned development in both the cities of Antioch and Brentwood, several sources of data were reviewed, including the Contra Costa County Travel Demand Model (CCTA Model), future traffic projections as documented in the administrative draft Antioch Transportation Impact Fee, future projections from the City of Brentwood Priority Area 1 Specific Plan EIR, June 2018, and projections developed as part of the Aviano and Vineyards at Sand Creek transportation impact studies. Traffic forecasts within the immediate study area were reviewed to ensure that known developments were adequately reflected in the forecasts, such as the Bridle Gate project located on the south side of the proposed Sand Creek extensions, west of State Route 4, and development of the Albers Property, east of the project site. Minor adjustments were made to the forecasts to balance traffic volumes between closely spaced intersections in the study area. The resulting Cumulative without Project forecasts are presented on **Figure 13**, which are representative of conditions over the next 20 to 25 years. The project volumes from **Figure 8** were added to the volumes presented in **Figure 13** to represent Cumulative with Project conditions, as presented on **Figure 14**. The potential traffic shifts associated with completing the connection of Sand Creek Road at Dallas Ranch Road to State Route 4 are also reflected in the volumes presented on **Figure 14**.

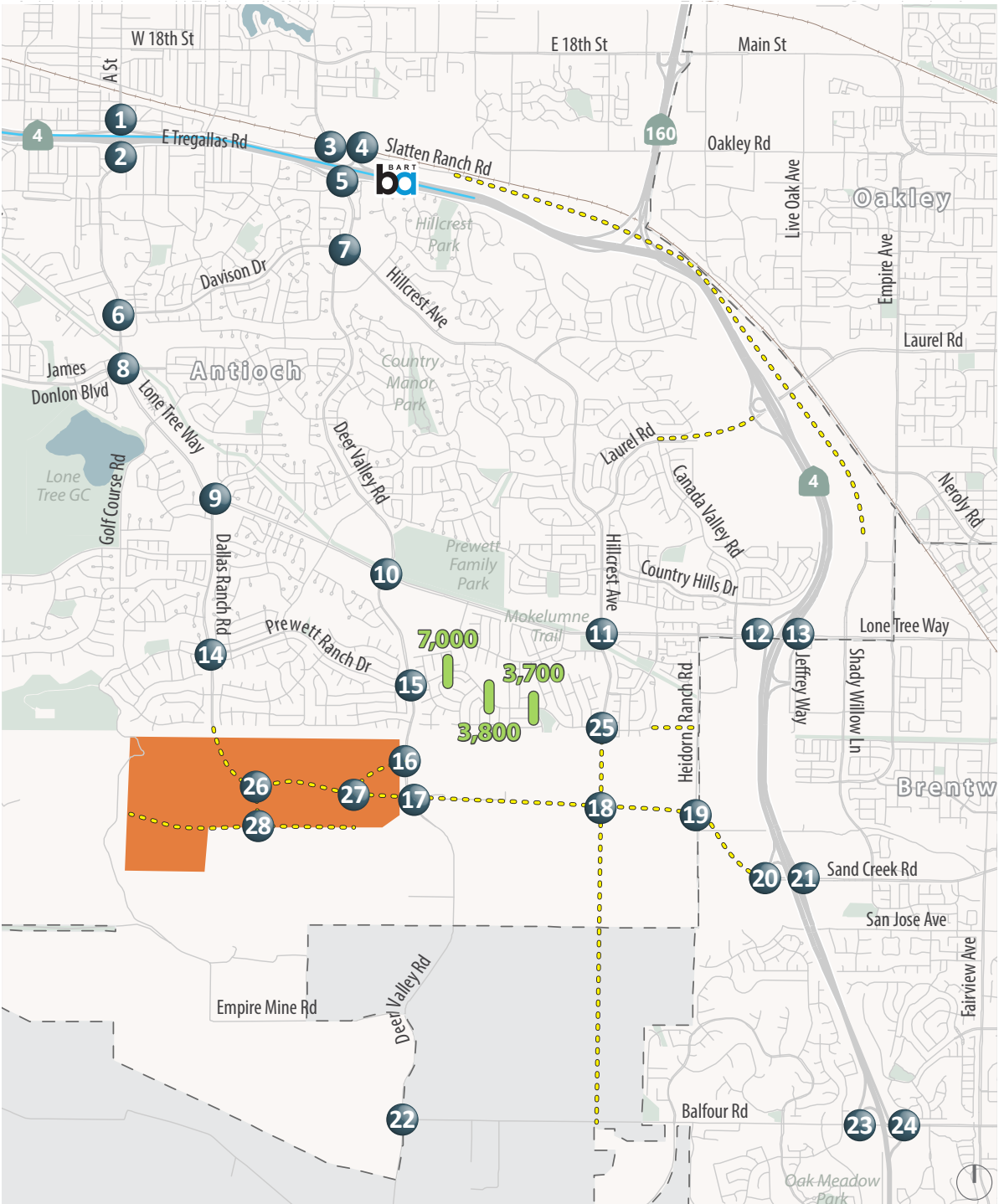
### Cumulative Roadway Assumptions

In addition to the roadway improvements considered in the analysis of near-term conditions, as detailed in Chapter 5, the extension of Hillcrest Avenue to Balfour Road was considered in the Cumulative condition in conjunction with the construction of Sand Creek Road between the Kaiser Medical Center and Deer Valley Road. Widening of State Route 4 to provide two travel lanes in each direction from south of Balfour Road to Marsh Creek Road was assumed to be completed in the cumulative condition.

As part of the project, roadway improvements would be constructed to extend Sand Creek Road from Deer Valley Road to Dallas Ranch Road, and Deer Valley Road would be improved along the project frontage to provide two travel lanes in each direction through the Sand Creek Road intersection, where it would taper to a two-lane cross-section. An assessment of on-site intersections is provided in the site plan review chapter.

The assumed lane configurations in each scenario are shown on **Figure 13** and **Figure 14**.

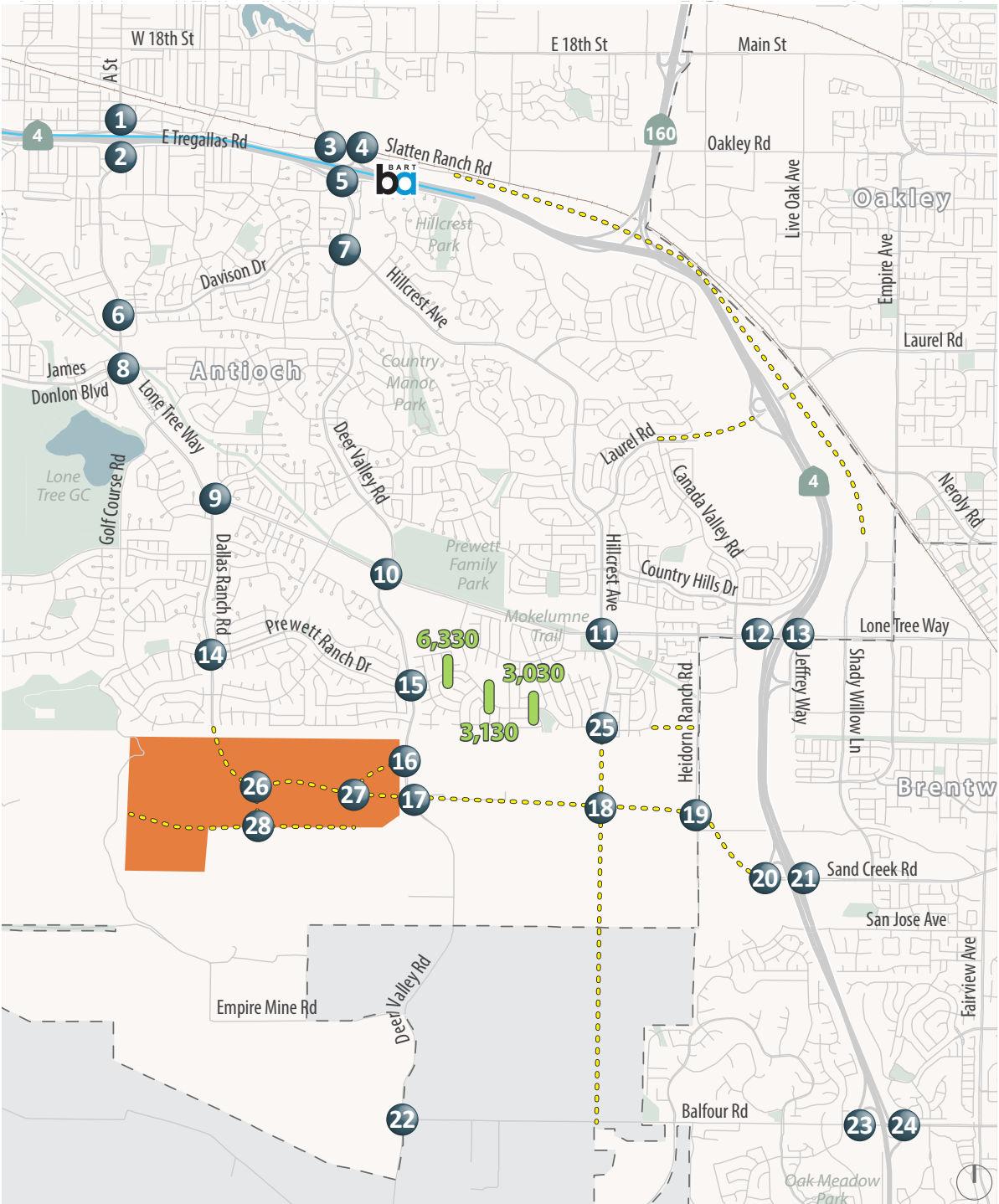
Vehicle traffic generated by the proposed project would contribute to the need for local and regional roadway improvements. The project would contribute to the construction of regional roadway improvements through participation in the regional transportation impact fee program.



XX (YY) AM (PM) Peak Hour Traffic Volumes  
Signalized Intersection  
Stop Sign  
Project Site  
Planned Future Roadway  
Study Intersection  
Daily Roadway Segment Volume

<p>1. Lone Tree Way/SR 4 (Westbound Ramps)</p>	<p>2. Lone Tree Way/SR 4 (Eastbound Ramps)</p>	<p>3. Hillcrest Avenue/Sunset Drive/Slatten Ranch</p>	<p>4. SR 4 WB Ramps/Slatten Ranch</p>	<p>5. Hillcrest Avenue/SR 4 Eastbound Ramps</p>
<p>6. Lone Tree Way/Davison Drive</p>	<p>7. Hillcrest Ave/Deer Valley Rd/Davison Dr</p>	<p>8. Lone Tree Way/James Donlon Blvd/Ridgerock Dr</p>	<p>9. Eagleridge Dr/Dallas Ranch Rd/Lone Tree Way</p>	<p>10. Deer Valley Road/Lone Tree Way</p>
<p>11. Hillcrest Avenue/Lone Tree Way</p>	<p>12. SR 4 Eastbound/Lone Tree Way</p>	<p>13. SR 4 Westbound/Lone Tree Way</p>	<p>14. Dallas Ranch Rd/Prewett Ranch Dr/Prewett Ranch Rd</p>	<p>15. Deer Valley Road/Prewett Ranch Drive</p>
<p>16. Deer Valley Road/Wellness Way</p>	<p>17. Deer Valley Road/Sand Creek Road</p>	<p>18. Hillcrest Avenue/Sand Creek Road</p>	<p>19. Heidorn Ranch Road/Sand Creek Road</p>	<p>20. SR 4 (EB Ramps)/Sand Creek Road</p>
<p>21. SR 4 (WB Ramps)/Sand Creek Road</p>	<p>22. Deer Valley Road/Balfour Road</p>	<p>23. SR-4 EB Ramps/Balfour Road</p>	<p>24. SR-4 WB Ramps/Balfour Road</p>	<p>25. Hillcrest Avenue/Prewett Ranch Drive</p>

Figure 13  
Cumulative without Project Peak Hour  
Intersection Traffic Volumes, Lane Configurations and Traffic Controls



XX (YY) AM (PM) Peak Hour Traffic Volumes  
Signalized Intersection  
Stop Sign  
Project Site  
Planned Future Roadway  
Study Intersection  
Daily Roadway Segment Volume

<p>1. Lone Tree Way/SR 4 (Westbound Ramps)</p>	<p>2. Lone Tree Way/SR 4 (Eastbound Ramps)</p>	<p>3. Hillcrest Avenue/Sunset Drive/Slatten Ranch</p>	<p>4. SR 4 WB Ramps/Slatten Ranch</p>	<p>5. Hillcrest Avenue/SR 4 Eastbound Ramps</p>
<p>6. Lone Tree Way/Davison Drive</p>	<p>7. Hillcrest Ave/Deer Valley Rd/Davison Dr</p>	<p>8. Lone Tree Way/James Donlon Blvd/Ridgerock Dr</p>	<p>9. Eagleridge Dr/Dallas Ranch Rd/Lone Tree Way</p>	<p>10. Deer Valley Road/Lone Tree Way</p>
<p>11. Hillcrest Avenue/Lone Tree Way</p>	<p>12. SR 4 Eastbound/Lone Tree Way</p>	<p>13. SR 4 Westbound/Lone Tree Way</p>	<p>14. Dallas Ranch Rd/Prewett Ranch Dr/Prewett Ranch Rd</p>	<p>15. Deer Valley Road/Prewett Ranch Drive</p>
<p>16. Deer Valley Road/Wellness Way</p>	<p>17. Deer Valley Road/Sand Creek Road</p>	<p>18. Hillcrest Avenue/Sand Creek Road</p>	<p>19. Heidorn Ranch Road/Sand Creek Road</p>	<p>20. SR 4 (EB Ramps)/Sand Creek Road</p>
<p>21. SR 4 (WB Ramps)/Sand Creek Road</p>	<p>22. Deer Valley Road/Balfour Road</p>	<p>23. SR-4 EB Ramps/Balfour Road</p>	<p>24. SR-4 WB Ramps/Balfour Road</p>	<p>25. Hillcrest Avenue/Prewett Ranch Drive</p>

Figure 14

Cumulative with Project Peak Hour  
Intersection Traffic Volumes, Lane Configurations and Traffic Controls





# Analysis of Cumulative Conditions

## Intersection Operations

Cumulative without and with Project conditions were evaluated using the same methods described in Chapter 1. The analysis results are presented in **Table 14**, based on the traffic volumes presented on **Figure 13** and **Figure 14**. Ten intersections are projected to operate at deficient levels in the cumulative condition prior to the addition of project traffic:

- Hillcrest Avenue at State Route 4 Eastbound Ramps – LOS F AM and PM Peak Hour
- Deer Valley at Hillcrest Avenue/Davison Drive – LOS E AM Peak Hour and LOS F PM Peak Hour
- Lone Tree Way at Hillcrest Avenue – LOS F AM Peak Hour and LOS E PM Peak Hour
- Lone Tree Way at SR 4 Eastbound Ramps – LOS F AM and PM Peak Hour
- Lone Tree Way at SR 4 Westbound Ramps – LOS E AM Peak Hour and LOS F PM Peak Hour
- Prewett Ranch Drive at Deer Valley Road – LOS E AM Peak Hour
- Sand Creek Road at State Route 4 Eastbound Ramps – LOS F AM and PM Peak Hour
- Sand Creek Road at State Route 4 Westbound Ramps – LOS E AM Peak Hour
- Balfour Road at Deer Valley Road – LOS F AM and PM Peak hour
- Balfour Road at State Route 4 Eastbound Ramps – LOS E PM Peak Hour

The addition of project traffic and associated project roadway improvements would improve operations of the Prewett Ranch Drive at Deer Valley Road intersection. Delay at all other intersections would increase, resulting in potentially significant impacts. The addition of project traffic would also result in LOS E operations at the Lone Tree Way at Davison Drive intersection in the AM peak hour.

Vehicle queues are expected to increase at study intersections as traffic volumes increase, which would further increase with the addition of project traffic. Monitoring and adjusting traffic signal timings in response to actual traffic volumes to minimize the potential for vehicle queue spillback is recommended.

Peak hour signal warrants are satisfied at the Balfour Road at Deer Valley Road intersection in the Cumulative condition prior to the addition of project traffic.



**Table 14: Cumulative Conditions Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Cumulative without Project		Cumulative with Project		Impact?
			Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS	
1. Lone Tree Way/A Street/State Route 4 Westbound Ramps	Signal	AM PM	25 33	C C	30 38	C D	No No
2. Lone Tree Way/A Street/State Route 4 Eastbound Ramps	Signal	AM PM	22 30	C C	24 45	C D	No No
3. Hillcrest Avenue/Sunset Drive/Slatten Ranch Road	Signal	AM PM	24 41	C D	24 42	C D	No No
4. Slatten Ranch Road/State Route 4 Westbound Ramps	Signal	AM PM	31 12	C B	32 12	C B	No No
5. Hillcrest Avenue/State Route 4 Eastbound Ramps	Signal	AM PM	<b>94</b> <b>227</b>	<b>F</b> <b>F</b>	<b>96</b> <b>235</b>	<b>F</b> <b>F</b>	<b>Yes;</b> increases traffic at deficient location
6. Lone Tree Way/Davison Drive	Signal	AM PM	43 22	D C	<b>56</b> 24	<b>E</b> C	<b>Yes;</b> results in LOS E operations
7. Deer Valley Road/Hillcrest Avenue/Davison Drive	Signal	AM PM	<b>67</b> <b>107</b>	<b>E</b> <b>F</b>	<b>68</b> <b>116</b>	<b>E</b> <b>F</b>	<b>Yes;</b> increases traffic at deficient location
8. Lone Tree Way/James Donlon Boulevard	Signal	AM PM	31 21	C C	33 23	C C	No No
9. Lone Tree Way/Dallas Ranch Road	Signal	AM PM	31 17	C B	38 20	D C	No No
10. Lone Tree Way/Deer Valley Road	Signal	AM PM	41 38	D D	46 48	D D	No No n
11. Lone Tree Way/Hillcrest Avenue	Signal	AM PM	<b>81</b> <b>77</b>	<b>F</b> <b>E</b>	<b>82</b> <b>79</b>	<b>F</b> <b>E</b>	<b>Yes;</b> increases traffic at deficient location
12. Lone Tree Way/State Route 4 Eastbound Ramps	Signal	AM PM	<b>97</b> <b>133</b>	<b>F</b> <b>F</b>	<b>98</b> <b>134</b>	<b>F</b> <b>F</b>	<b>Yes;</b> increases traffic at deficient location
13. Lone Tree Way/State Route 4 Westbound Ramps/Jeffery Way	Signal	AM PM	<b>68</b> <b>87</b>	<b>E</b> <b>F</b>	<b>69</b> <b>88</b>	<b>E</b> <b>F</b>	<b>Yes;</b> increases traffic at deficient location
14. Prewett Ranch Drive/Dallas Ranch Road	Signal	AM PM	27 17	C B	30 18	C B	No No
15. Prewett Ranch Drive/Deer Valley Road	Signal	AM PM	<b>78</b> 23	<b>E</b> C	<b>68</b> 24	<b>E</b> C	No; results in a decrease in delay with the provision of parallel capacity.



**Table 14: Cumulative Conditions Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Cumulative without Project		Cumulative with Project		Impact?
			Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS	
16. Deer Valley Road/Wellness Way/Street A	Signal	AM PM	10 7	A A	11 6	B A	No No
17. Sand Creek Road/Deer Valley Road	Signal	AM PM	9 10	A A	17 14	B B	No No
18. Sand Creek Road/Hillcrest Avenue	Signal	AM PM	44 49	D D	47 54	D D	No No
19. Sand Creek Road/Heidorn Ranch Road	Signal	AM PM	14 14	B B	14 15	B B	No No
20. Sand Creek Road/State Route 4 Eastbound Ramps	Signal	AM PM	<b>81</b> <b>103</b>	<b>F</b> <b>F</b>	<b>90</b> <b>120</b>	<b>F</b> <b>F</b>	<b>Yes;</b> increases traffic at deficient location
21. Sand Creek Road/State Route 4 Westbound Ramps	Signal	AM PM	<b>56</b> 24	<b>E</b> C	<b>62</b> 27	<b>E</b> C	<b>Yes;</b> increases traffic at deficient location
22. Balfour Road/Deer Valley Road	SSSC	AM PM	<b>&gt; 150</b> ( <b>&gt; 180</b> ) <b>98</b> ( <b>&gt; 180</b> )	<b>F (F)</b> <b>F (F)</b>	<b>&gt; 150</b> ( <b>&gt; 180</b> ) <b>139</b> ( <b>&gt; 180</b> )	<b>F (F)</b> <b>F (F)</b>	<b>Yes;</b> deficient side-street and overall operations and signal warrants met.
23. Balfour Road/State Route 4 Eastbound Ramps	Signal	AM PM	43 <b>56</b>	D <b>E</b>	43 <b>58</b>	D <b>E</b>	<b>Yes;</b> increases traffic at deficient location
24. Balfour Road/State Route 4 Westbound Ramps	Signal	AM PM	25 19	C B	25 19	C B	No No
25. Prewett Ranch Drive/Hillcrest Avenue	Signal	AM PM	39 18	D B	41 19	D B	No No

Notes: **Bold** reflects potentially deficient operations; **Bold Italics** reflects potentially significant impact.

1. Signal = signalized intersection; SSSC = side-street stop-controlled

2. Average intersection delay is calculated for all signalized intersections using the HCM 6<sup>th</sup> Edition method for vehicles.

3. Intersection operations improve with the project as the combination of the Sand Creek Road connection between Dallas Ranch Road and Deer Valley Road, and the Sand Creek Road extension between Dozier-Libbey Medical High School and Deer Valley Road is expected to result in some existing travel from the Dallas Ranch neighborhood shifting to the Sand Creek Road corridor, reducing traffic through the Prewett Ranch Road intersection at Deer Valley Road.

Source: Fehr & Peers, 2019

## Daily Roadway Segment Operation

Cumulative traffic forecasts were developed for Prewett Ranch Drive based on the same procedures and assumptions described previously for intersections, with the resulting volumes shown in **Table 15**. Project trips were then estimated considering the changes to the roadway network in the cumulative condition with the project, and then added to the Cumulative without Project volumes. With the construction of the project roadway system, some existing trips that originate in the Dallas Ranch neighborhoods are expected to shift from traveling on Prewett Ranch Drive to Sand Creek Road. The percent increase in project trips was also calculated, with the results presented in **Table 15**.

**Table 15: Cumulative Conditions Average Daily Roadway Segment Volumes**

Segment	Cumulative Without Project Daily Traffic	Project Traffic	Expected Traffic Shift with Project <sup>1</sup>	Cumulative With Project	Existing Daily Fluctuation <sup>2</sup>	Project Increase
1. Prewett Ranch Drive, east of Deer Valley Road	7,000	80	-900	6,330	± 1.2%	1%
2. Prewett Ranch Drive at Diablo Vista Elementary School	3,800	80	-900	3,130	± 1.8%	1%
3. Prewett Ranch Drive, west of Hillcrest Avenue	3,700	80	-900	3,030	± 2.9%	1%

Notes: 1. Level of existing traffic from the Dallas Ranch Neighborhood that is expected to shift to Sand Creek Road once the connection between Dallas Ranch Road and State Route 4 is completed.  
2. Percent difference between the three days of data collection.

Source: Fehr & Peers, 2019

With completion of the Sand Creek Road corridor, and the resulting traffic shifts away from Prewett Ranch Drive, the segments of Prewett Ranch Drive between Deer Valley Road and Hillcrest Avenue are expected to experience levels of daily traffic appropriate for the roadway type.



# Cumulative Conditions Impacts and Mitigation

Potential off-site intersection impacts were identified in the Cumulative condition.

**Impact Statement 7:** Intersection 5 – Hillcrest Avenue at State Route 4 Eastbound Ramps

The Hillcrest Avenue at State Route 4 Eastbound Ramps intersection operates at a deficient LOS F during both peak hours prior to the addition of project traffic in the cumulative condition. The addition of project traffic would worsen operations by two seconds in the morning peak hour and eight seconds in the evening peak hour. Based on the significance criteria, this is considered a **significant** impact. As detailed in Chapter 7, this impact would occur with Phase 1 of the project.

**Mitigation Measure 7:** The Project Applicant shall fund the design and installation of ASCT or other traffic signal interconnect system approved by the City at the following intersections (same as Mitigation Measure 1):

- Slatten Ranch Road at State Route 4 Westbound Ramps
- Slatten Ranch Road/Sunset Drive at Hillcrest Avenue
- Hillcrest Avenue at State Route 4 Eastbound Ramps
- East Tregallas Road/Larkspur Drive at Hillcrest Avenue

In conjunction with the signal timing adjustments, the Project Applicant shall also work with the City and Caltrans to design and install potential restriping options within the Hillcrest Avenue at SR 4 interchange area that improve vehicle and bicycle travel through the interchange area.

The design process shall start prior to the issuance of the 10<sup>th</sup> residential building permit for the project and installation shall be completed prior to the issuance of the 422<sup>nd</sup> building permit unless the City of Antioch Traffic Engineer determines that design and installation delays are beyond the control of the Project Applicant.

As other projects would benefit from this improvement, a reimbursement agreement could be established by the Applicant with the City of Antioch. During the PM peak hour in the Cumulative condition, project traffic represents 1 percent of the traffic flow, other cumulative growth represents 31 percent of traffic flow, and existing traffic represents 69 percent of traffic flow.



With signal timing adjustments to better serve projected traffic flows, intersection operations would improve to better than the without project condition, as shown in **Table 16**.

Although the implementation of the above measures would reduce the impact to a less-than significant level, Caltrans controls the operations of the traffic signals at the Slatten Ranch Road at State Route 4 Westbound Ramps and Hillcrest Avenue at State Route 4 Eastbound Ramps intersection. Although Caltrans staff has indicated initial support for the striping changes and installation of traffic signal equipment to improve operations for all modes of travel through the interchange, the City cannot assure full implementation of this improvement and the impact would remain **significant and unavoidable** if Caltrans does not accept the improvements.

**Impact Statement 8:** Intersection 6 – Lone Tree Way at Davison Drive

The Lone Tree Way at Davison Drive intersection is projected to operate at an acceptable LOS D in the AM peak hour prior to the addition of project traffic in the cumulative condition. The addition of project traffic would result in LOS E operations. Based on the significance criteria, this is considered a **significant** impact. As detailed in Chapter 7, this impact would occur with project buildout.

**Mitigation Measure 8:** The Project Applicant shall restripe the westbound approach to convert the westbound through lane to a left-thru shared lane prior to the issuance of the 1,000<sup>th</sup> residential building permit. The median on the south leg of the intersection may need to be reconstructed to allow concurrent left-turn movements on the westbound approach. Implementation of this improvement in combination with retiming of the traffic signal would result in overall acceptable service levels, reducing the project's impact to a **less-than-significant** level, as shown in **Table 16**.

**Impact Statement 9:** Intersection 7 – Deer Valley Road at Hillcrest Avenue/Davison Drive

The Deer Valley Road at Hillcrest Avenue/Davison Drive intersection is projected to operate at an unacceptable LOS E in the AM peak hour and LOS F in the PM peak hour prior to the addition of project traffic in the cumulative condition. The project would add traffic and increase delay by one second in the AM peak hour and nine seconds in the PM peak hour. Based on the significance criteria, this is considered a **significant** impact. As detailed in Chapter 7, this impact would occur with Phase 1 of the project.

**Mitigation Measure 9:** The Project Applicant shall fund the design and installation of Adaptive Signal Control Technologies (ASCT) or other traffic signal interconnect system approved by the City at the following intersections:

- Deer Valley Road at Hillcrest Avenue/Davison Drive
- Hillcrest Avenue at Hillcrest Crossroads

This would create an adaptive signal control corridor between State Route 4 and Deer Valley Road on Hillcrest Avenue. Implementation of this improvement would result in better operations than the Cumulative without Project condition when also implemented with Mitigation Measure 1, reducing the project's impact to a ***less-than-significant*** level, as shown in **Table 16**.

The design process shall start prior to the issuance of the 10<sup>th</sup> residential building permit for the project, and installation shall be completed prior to the issuance of the 422<sup>nd</sup> building permit unless the City of Antioch Traffic Engineer determines that design and installation delays are beyond the control of the Project Applicant. The system at the Deer Valley Road at Hillcrest Avenue/Davison Drive and Hillcrest Avenue at Hillcrest Crossroads shall be coordinated with the ASCT systems identified as part of Mitigation Measure 1.

**Impact Statement 10:** Intersection 11 – Lone Tree Way at Hillcrest Avenue

The Lone Tree Way at Hillcrest Avenue intersection is projected to operate at a deficient LOS E in the AM peak hour and a LOS F in the PM peak hour prior to the addition of project traffic in the cumulative condition, and the project would add traffic through the intersection, increasing delay during the morning peak hour by one second and in the evening peak hour by two seconds. Based on the significance criteria, this is considered a ***significant*** impact. As detailed in Chapter 7, this impact would occur with Phase 1 of the project. Project traffic comprises 1.5 percent of overall traffic growth through this intersection in the cumulative condition.

**Mitigation Measure 10:** The Project Applicant shall implement improvements that would improve operations to LOS D within the existing right-of-way, which could include modifying the eastbound approach to provide two left-turn lanes, two through lanes and a through-right-shared lane through the reconstruction of the median, restriping, and signal modifications. The outside curbs may need to be modified to provide for appropriate lane-alignments. A reimbursement agreement could be established with the City of Antioch to collect proportionate shares from other developments that would benefit from this improvement. Implementation of this measure would reduce the project impact to a ***less-than-significant*** level.

**Impact Statement 11:** Intersection 12 – Lone Tree Way at State Route 4 Eastbound Ramps

The Lone Tree Way at State Route 4 Eastbound Ramps intersection is projected to operate at a deficient LOS F in the AM and PM peak hours prior to the addition of project traffic in the cumulative condition, and the project would add traffic through the intersection, increasing delay by one second in the morning peak hour and one second in the evening peak hour. Based on the significance criteria, this is considered a

**significant** impact. As detailed in Chapter 7, this impact would occur with Phase 1 of the project. Project traffic comprises 1 percent of overall traffic growth through the interchange in the cumulative condition.

**Mitigation Measure 11:** The Project Applicant shall pay their fair share towards potential improvements at this intersection through participation in the ECCRFFA regional fee program. Improvements may include optimization of the signal timing or widening of the southbound off-ramp to provide a second southbound right-turn only lane.

These potential improvements would improve intersections operations; however, they would not result in LOS D operations, as presented in **Table 16** (effects of signal timing shown in **Table 16**), in the Cumulative condition. Therefore, as payment of fees cannot assure that effective improvements would be implemented, the cumulative impact would remain **significant and unavoidable**.

**Impact Statement 12:** Intersection 13 - Lone Tree Way at State Route 4 Westbound Ramps/Jeffery Way

The Lone Tree Way at State Route 4 Westbound Ramps/Jeffery Way intersection is projected to operate at a deficient LOS F in the AM and PM peak hours prior to the addition of project traffic in the cumulative condition, and the project would add traffic through the intersection and increase delay by one second in the morning peak hour and one second in the evening peak hour. Based on the significance criteria, this is considered a **significant** impact. As detailed in Chapter 7, this impact would occur with Phase 1 of the project.

**Mitigation Measure 12:** The Project Applicant shall restripe the westbound approach to provide a second westbound left-turn lane (requires widening of the south leg of the intersection to provide a second southbound receiving lane, which is currently under construction) by the time the 431<sup>st</sup> residential building permit is issued. This improvement is under construction by others and would only be required if not already in place by the time the 431<sup>st</sup> residential building permit is issued.

This improvement would result in acceptable operations during the PM peak hour and decrease the delay in the morning peak hour to the same as under the without project condition. As the improvement would not result in LOS D operations, and City of Antioch cannot assure its implementation as the intersection is located in the City of Brentwood, the impact would remain **significant and unavoidable**.

**Impact Statement 13:** Intersection 20 – Sand Creek Road at SR 4 EB Ramps

The Sand Creek Road at State Route 4 Eastbound Ramps intersection is projected to operate at a deficient LOS F in the PM peak hour prior to the addition of project traffic in the cumulative condition, and the project



would add traffic through the intersection, increasing average delay by nine seconds during the morning peak hour and 17 seconds during the evening peak hour. Based on the significance criteria, this is considered a **significant** impact. As detailed in Chapter 7, this impact would occur with Phase 1 of the project. Project traffic comprises 7.3 percent of overall traffic growth through the interchange in the cumulative condition.

**Mitigation Measure 13:** The project shall pay their proportionate share of the improvements that would improve operations through participation in the ECCRFFA regional fee program. Planned improvements include construction of a slip-ramp for the eastbound Sand Creek to southbound State Route 4 movement, eliminating the conflicting left-turn movement at the intersection.

This improvement is included in the regional fee program and implementation of this improvement would result in overall acceptable service levels, reducing the projects impact to a **less-than-significant** level. However, inclusion in the fee program does not assure that the improvement would be constructed concurrent with the impact and the impact could remain **significant and unavoidable** until the improvement is constructed.

**Impact Statement 14:** Intersection 21 – Sand Creek Road at SR 4 WB Ramps

The Sand Creek Road at State Route 4 Westbound Ramps intersection is projected to operate at a deficient LOS E in the AM peak hour prior to the addition of project traffic in the cumulative condition, and the project would increase delay by six seconds during the AM peak hour. Based on the significance criteria, this is considered a **significant** impact. As detailed in Chapter 7, this impact would occur with Phase 1 of the project. Project traffic comprises 6.5 percent of overall traffic growth through the interchange in the cumulative condition.

**Mitigation Measure 14:** The project shall pay 6.5 percent of improvements that would improve operations, or shall participate in the ECCRFFA regional fee program if improvements that would result in acceptable operations at this intersection are added to the fee program. Modifying the westbound approach to provide two through lanes and two right-turn only lanes would result in acceptable operations during the morning peak hour.

This improvement is not included in the regional fee program, such that payment of fees may not be sufficient to mitigate the impact. Additionally, ECCRFFA does not have a mechanism to collect fair-share payments for improvements not in the fee program. As the City of Antioch cannot assure that this project would be implemented, the impact would remain **significant and unavoidable**.

**Impact Statement 15:** Intersection 22 – Balfour Road at Deer Valley Road

The addition of project-generated vehicle trips during both the AM and PM peak hours would worsen deficient conditions. Peak hour signal warrants are also met prior to the addition of project traffic in the cumulative condition. Based on the significance criteria, this is considered a **significant** impact. As detailed in Chapter 7, this impact would occur with Phase 1 of the project.

**Mitigation Measure 15:** Implement Mitigation Measure 2. The Project Applicant shall install a traffic signal at this intersection in conjunction with other planned improvements, which includes the construction of a southbound left-turn lane, as well as separate westbound left and right-turn lanes. Improvements shall be completed prior to the issuance of the 431<sup>st</sup> residential building permit.

These improvements would result in overall acceptable service levels, reducing the project's impact to a **less-than-significant** level, as shown in **Table 16**, as the Project Applicant would construct the improvements. The responsibility for improvements to this intersection are shared by the City of Antioch and the City of Brentwood. Therefore, a reimbursement agreement with the City of Brentwood for half the signal costs and the cost of all improvements on Balfour Road could be sought. Although the Project Applicant would be required to make the improvement, the impact could remain **significant and unavoidable** if either the City of Brentwood or Contra Costa County do not approve/accept the improvements.

**Impact Statement 16:** Intersection 23 – Balfour Road at State Route 4 Eastbound Ramps

The Balfour Road at State Route 4 Eastbound Ramps intersection is projected to operate at a deficient LOS E in the PM peak hour prior to the addition of project traffic in the cumulative condition, and the project would add two seconds of delay at the intersection. Based on the significance criteria, this is considered a **significant** impact. As detailed in Chapter 7, this impact would occur with Phase 1 of the project. Project traffic comprises 2.7 percent of overall traffic growth through the interchange in the cumulative condition.

**Mitigation Measure 16:** The project shall pay their proportionate share of improvements that would improve operations. Restriping the southbound approach to provide two left turn lanes and one right-turn only lane would result in overall acceptable service levels, as shown in **Table 16**. Inclusion of this improvement or one of similar effectiveness (restriping the southbound approach to provide a left-turn lane, a shared left-through right lane, and a right-turn only lane) is being added to the ECCFRA Fee Program.

Even though improvements at this interchange would be included in the regional fee program, the City of Antioch cannot assure that the improvement would be implemented and the impact would remain **significant and unavoidable**.

**Table 16: Cumulative With Project With Mitigation Conditions Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Cumulative		Cumulative with Project		Cumulative with Project with Mitigation	
			Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS
5. Hillcrest Avenue/State Route 4 Eastbound Ramps	Signal	AM PM	<b>94</b> <b>227</b>	<b>F</b> <b>F</b>	<b>96</b> <b>235</b>	<b>F</b> <b>F</b>	<b>68</b> <b>224</b>	<b>E</b> <b>F</b>
6. Lone Tree Way/Davison Drive	Signal	AM PM	43 22	D C	<b>56</b> 24	<b>E</b> C	39 20	D C
7. Deer Valley Road/Hillcrest Avenue/Davison Drive	Signal	AM PM	<b>67</b> <b>107</b>	<b>E</b> <b>F</b>	<b>59</b> <b>98</b>	<b>E</b> <b>F</b>	55 <b>63</b>	D <b>E</b>
11. Lone Tree Way/Hillcrest Avenue	Signal	AM PM	<b>81</b> <b>77</b>	<b>F</b> <b>E</b>	<b>82</b> <b>79</b>	<b>F</b> <b>E</b>	42 <b>60</b>	D <b>E</b>
12. Lone Tree Way/State Route 4 Eastbound Ramps	Signal	AM PM	<b>97</b> <b>133</b>	<b>F</b> <b>F</b>	<b>98</b> <b>134</b>	<b>F</b> <b>F</b>	<b>92</b> <b>131</b>	<b>F</b> <b>F</b>
13. Lone Tree Way/State Route 4 Westbound Ramps/Jeffery Way	Signal	AM PM	<b>68</b> <b>87</b>	<b>E</b> <b>F</b>	<b>69</b> <b>88</b>	<b>E</b> <b>F</b>	<b>68</b> 51	<b>E</b> D
20. Sand Creek Road/ SR 4 EB Ramps	Signal	AM PM	<b>81</b> <b>103</b>	<b>F</b> <b>F</b>	<b>90</b> <b>120</b>	<b>F</b> <b>F</b>	22 32	C C
21. Sand Creek Road/ SR 4 WB Ramps	Signal	AM PM	<b>56</b> 24	<b>E</b> C	<b>62</b> 27	<b>E</b> C	44 22	D C
22. Balfour Road/Deer Valley Road	SSSC/ Signal	AM PM	<b>&gt; 150 (&gt; 180)</b> <b>98 (&gt; 180)</b>	<b>F (F)</b> <b>F (F)</b>	<b>&gt; 150 (&gt; 180)</b> <b>139 (&gt; 180)</b>	<b>F (F)</b> <b>F (F)</b>	12 12	B B
23. Balfour Road/State Route 4 Eastbound Ramps	Signal	AM PM	43 <b>56</b>	D <b>E</b>	43 <b>58</b>	D <b>E</b>	55 40	D D

Notes:

1. Signal = signalized intersection

2. Average intersection delay is calculated for all signalized intersections using the HCM 6<sup>th</sup> Edition method for vehicles.

Source: Fehr & Peers, 2019

## 7. Phasing Analysis

The project is proposed to be constructed in three major phases, with a conceptual phasing plan shown on **Figure 15**. As the project would likely be built-out over many years, the transportation impacts of the project may not materialize until substantial portions of the project are built and occupied.

### Phasing Plan

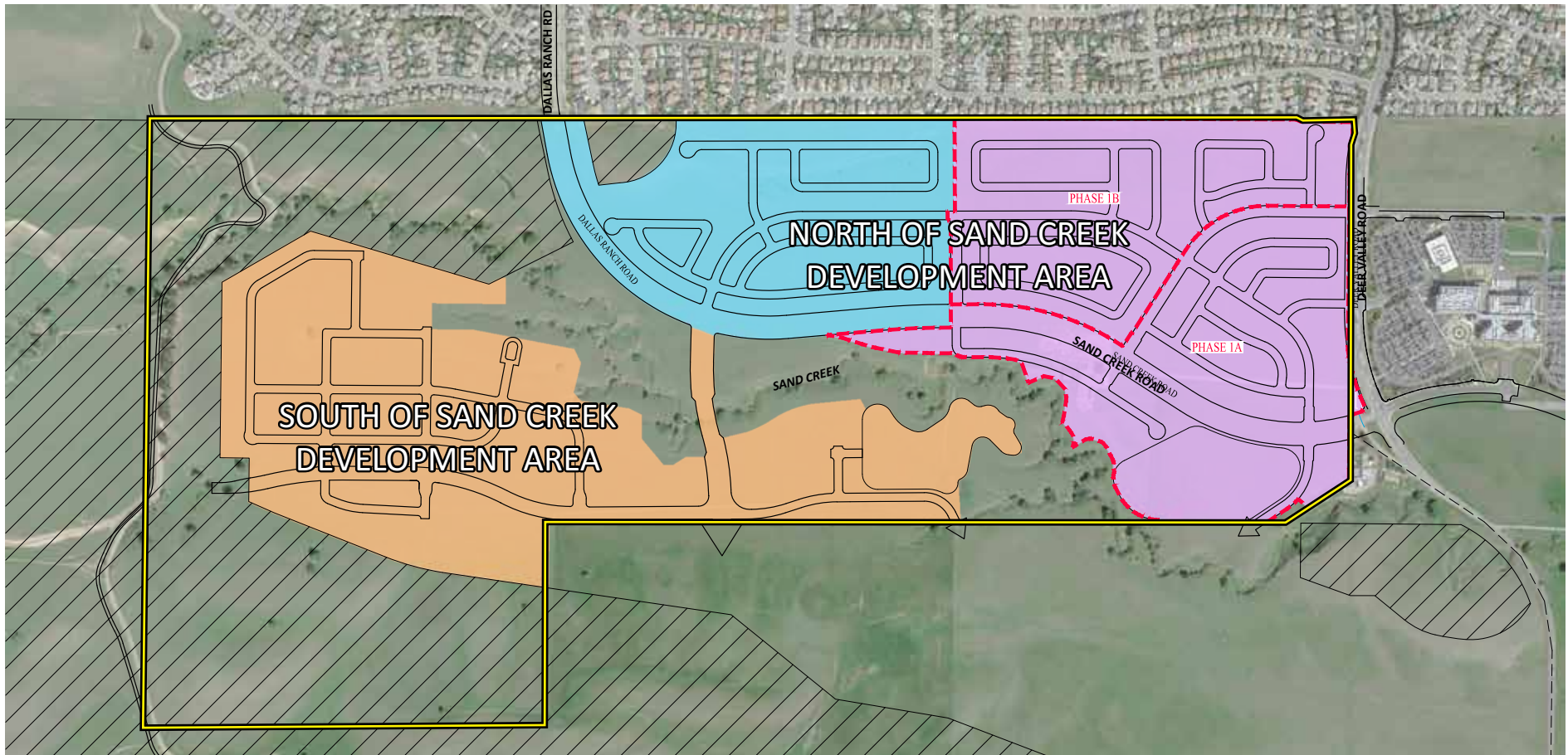
As shown on **Figure 15**, the project is proposed to be developed in three major phases. In the Phase 1, two major roadway connections from Deer Valley Road (Sand Creek Road and Street A) would be constructed in addition to all frontage improvements on Deer Valley Road. Sand Creek Road would be extended into the site to provide access to individual neighborhoods. Land uses that would be developed include the commercial site, and up to 421 single-family homes.

In Phase 2, Sand Creek Road would be extended further into the site to provide an additional neighborhood access point. For the purposes of preparing a conservative analysis, the extension of Sand Creek Road to Dallas Ranch Road was not assumed as this analysis is intended to identify when that connection is needed. Additional land uses that would be developed in Phase 2 include up to 201 single-family homes.

Project buildout would occur during Phase 3 and the analysis in the previous chapters identifies project impacts with full buildout.

### Project Travel Characteristics by Phase

Project trip generation by phase was estimated as presented in **Table 5**. Phase 1 of the project is expected to generate approximately 6,030 daily trips, including 365 morning peak hour (377 morning peak hour trips is all office is constructed in lieu of retail) and 625 evening peak hour trips. Should the commercial parcel not be developed or fully occupied in Phase 1, trip generation would be less. Phase 2 would generate an additional 1,900 daily trips, including 149 morning peak hour and 199 evening peak hour trips.



Site Plan Source: Carlson, Barbee & Gibson, Inc., June 20, 2019

	PHASE 1
	PHASE 2
	PHASE 3
	PHASE 1A/1B

GRADING AREA SUMMARY	
PHASE 1A	78 AC
PHASE 1B	60 AC
PHASE 2	73 AC
PHASE 3	135 AC

Project Site

Sand Creek Focus Area: Restricted Development Area



The project trip assignment by phase considers the roadway network that would be constructed as part of each phase. Project trip assignment for Phase 1 is shown on **Figure 16**, **Figure 18**, and **Figure 20** for the existing, near-term and cumulative roadway networks, and for Phase 2 on **Figure 17**, **Figure 19**, and **Figure 21** for the existing, near-term and cumulative roadway networks, respectively.

## Analysis Results

To estimate traffic volumes for each phase, project trips were added to the without project traffic volumes under existing, near-term and cumulative conditions. Intersection level of service analysis was conducted based on the methods outlined in Chapter 1. Analysis results are presented for study intersections that are impacted during at least one time period by the project; results for all intersections are presented in **Appendix F**. The results are presented in **Table 17** for the existing condition, **Table 18** for the near-term condition, and **Table 19** for the cumulative condition.

### Existing Condition

In the existing condition, all study intersections except the Hillcrest Avenue at State Route 4 Eastbound Ramps operate at an overall acceptable level. Results of the phasing analysis indicate that the addition of traffic from Phase 1 would worsen the operations of that intersection, but would not result in any new deficiencies, even considering all project access from Deer Valley Road.

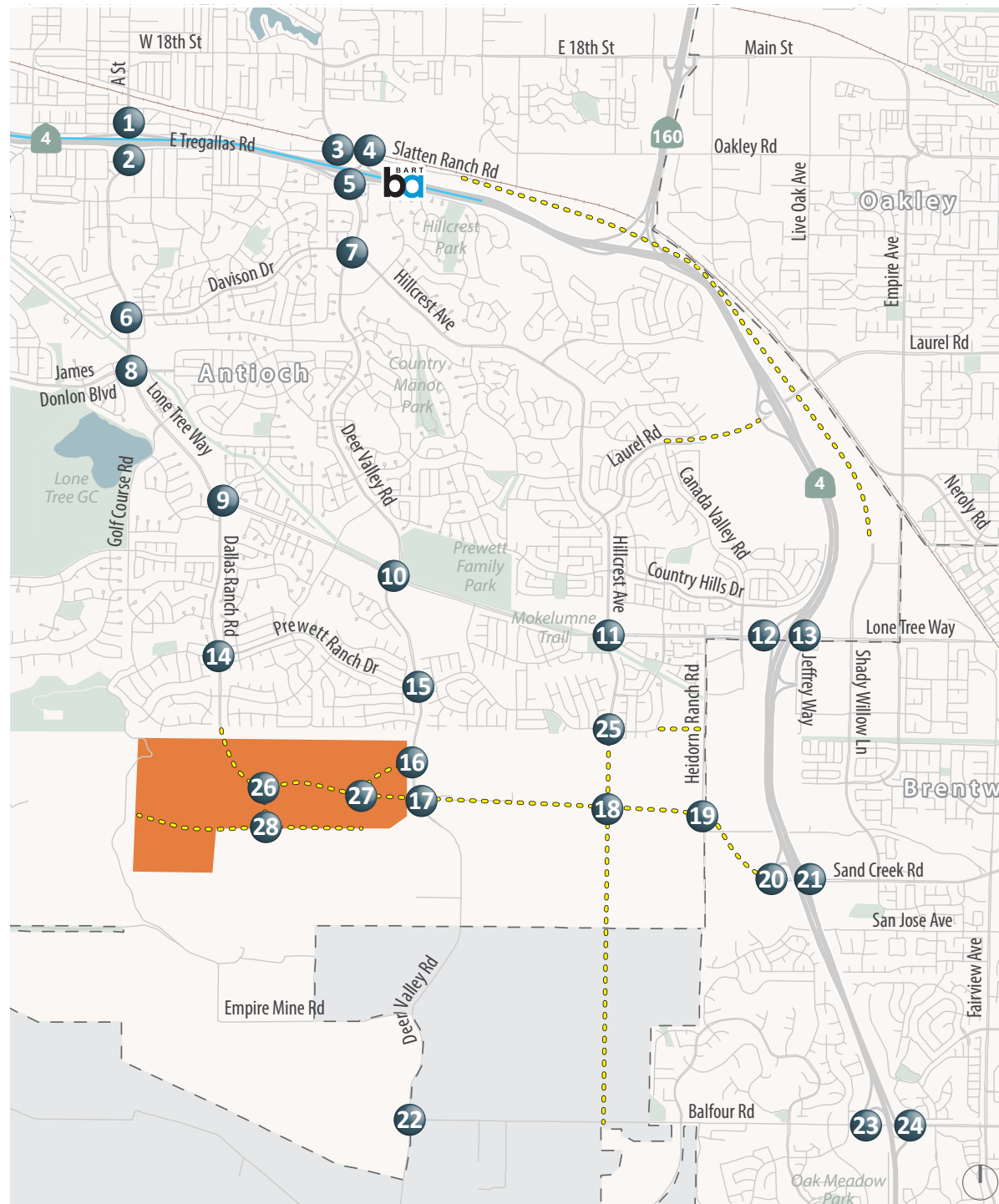
The addition of project traffic through Phase 2 would result in an impact at the Deer Valley Road at Balfour Road intersection as the side-street would degrade to LOS E and peak hour signal warrants would be met.

### Near-term Condition

In the near-term condition, two intersections are projected to operate at unacceptable levels prior to the addition of project traffic:

- 5. Hillcrest Avenue at State Route 4 Eastbound Ramps
- 12. Lone Tree Way at State Route 4 Eastbound Ramps





XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Site Planned Future Roadway Study Intersection

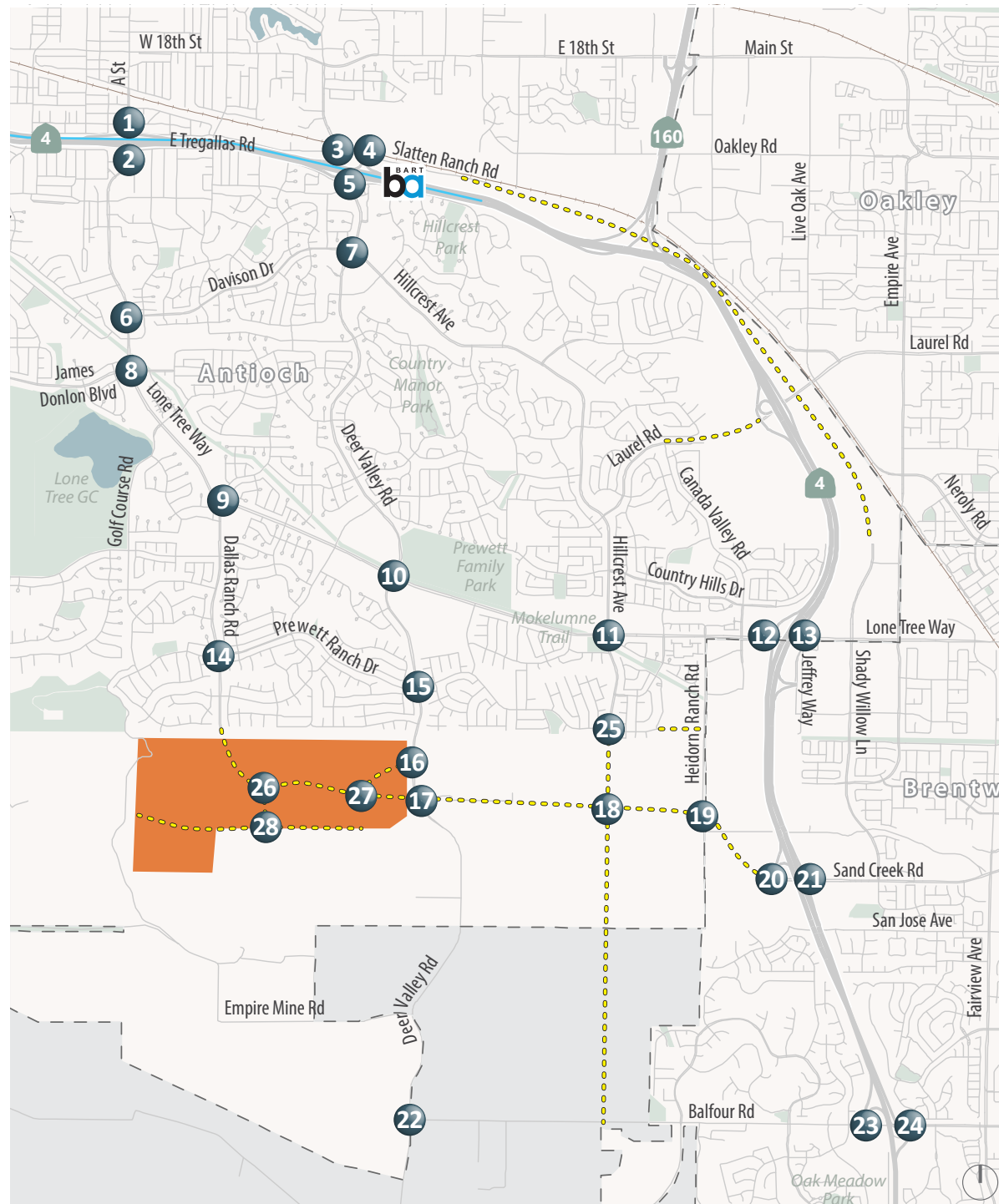
Future Intersection



Figure 16

## Project Trip Assignment Existing Roadway Network — Phase 1





XX (YY) AM (PM) Peak Hour Traffic Volumes



Signalized Intersection



Stop Sign



Project Site



Planned Future Roadway



Study Intersection



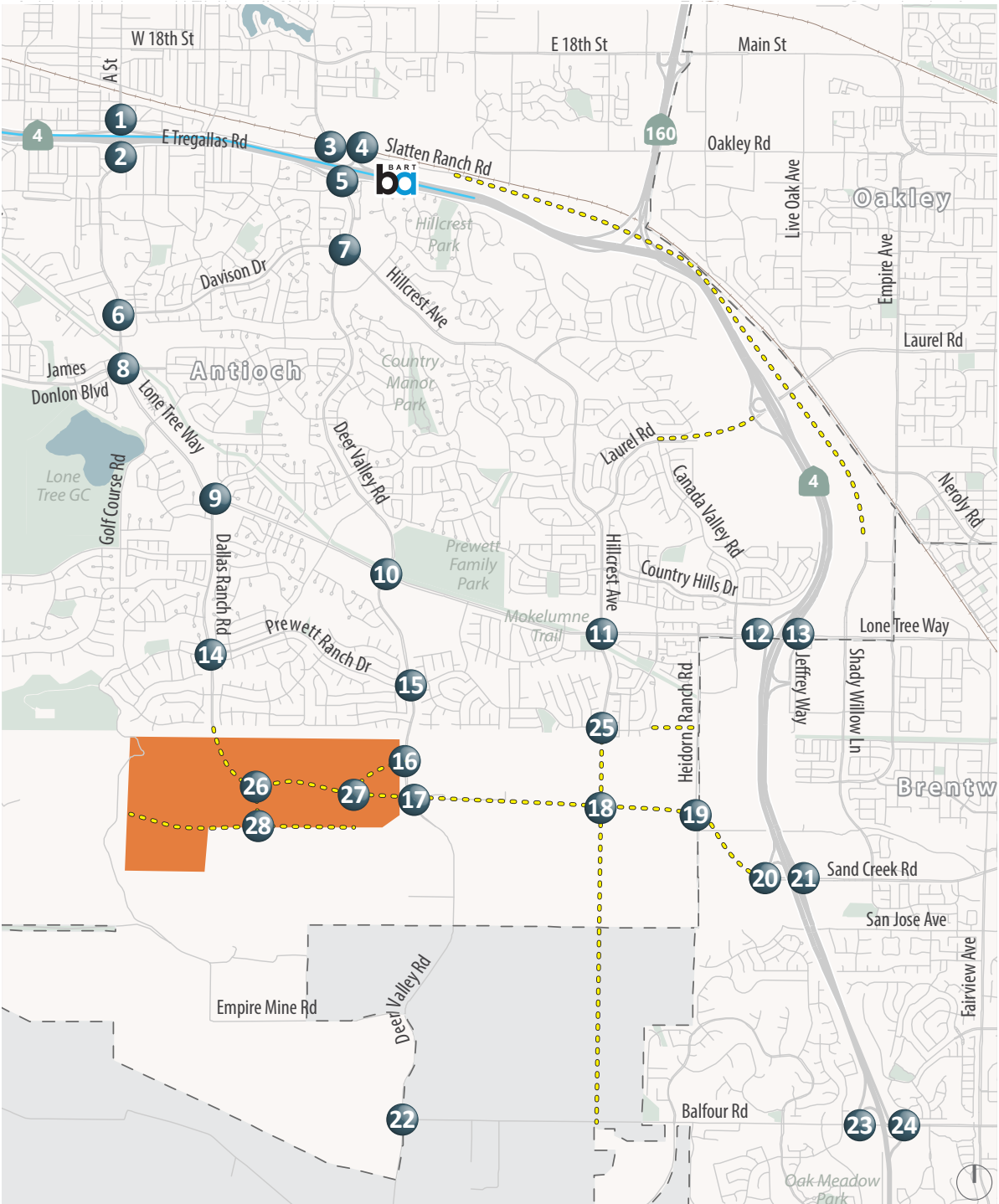
Future Intersection



Figure 17

## Project Trip Assignment Existing Roadway Network — Phase 2





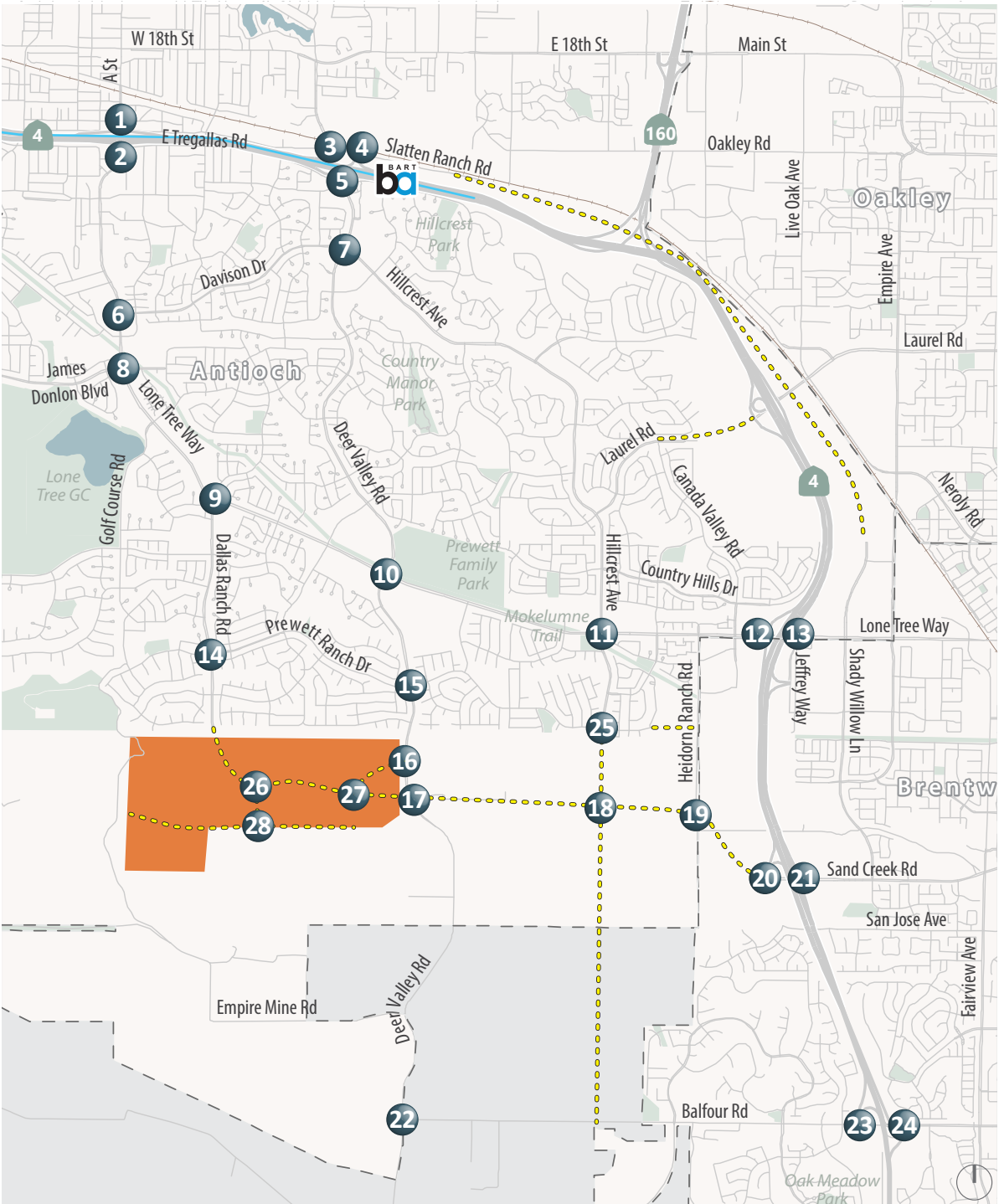
XX (YY)    AM (PM) Peak Hour Traffic Volumes    Signalized Intersection    Stop Sign

Project Site    Planned Future Roadway    Study Intersection



Figure 18  
Project Trip Assignment  
Near-Term Roadway Network — Phase 1

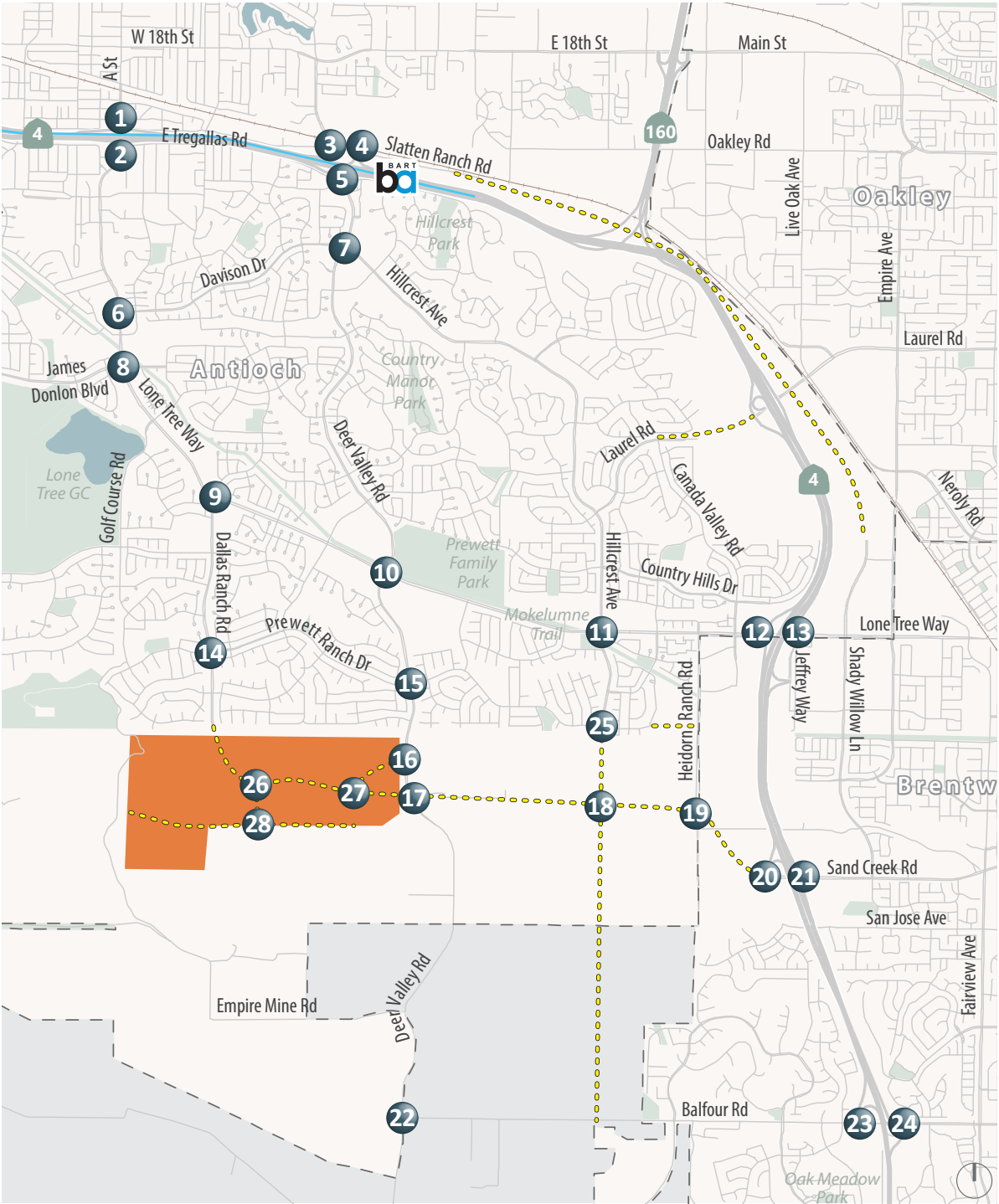




XX (YY) AM (PM) Peak Hour Traffic Volumes  
Signalized Intersection  
Stop Sign  
Project Site  
Planned Future Roadway  
Study Intersection



Figure 19  
Project Trip Assignment  
Near-Term Roadway Network — Phase 2

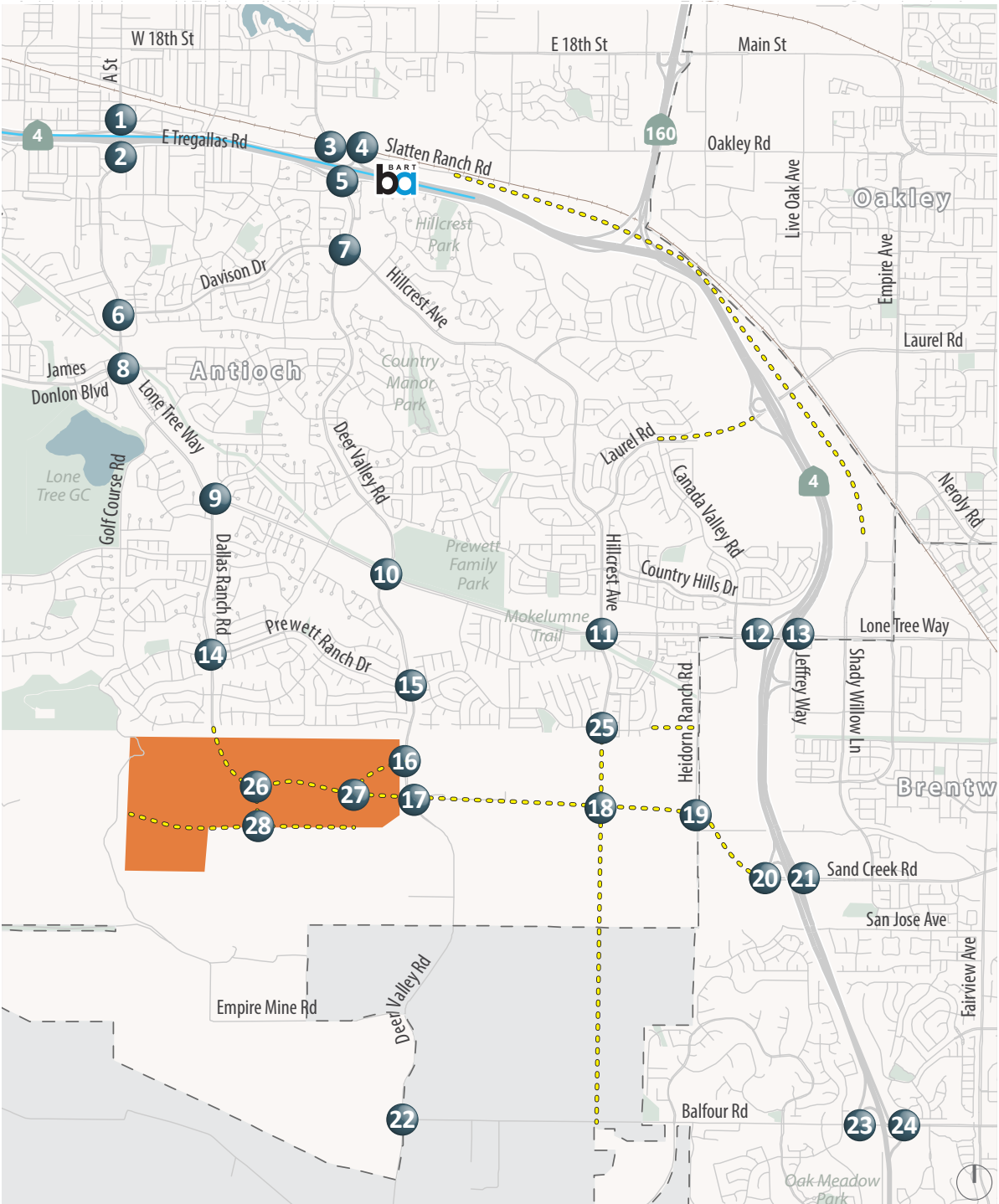


XX (YY)    AM (PM) Peak Hour Traffic Volumes    Signalized Intersection    Stop Sign

Project Site    Planned Future Roadway    Study Intersection



Figure 20  
Project Trip Assignment  
Cumulative Roadway Network — Phase 1



XX (YY) AM (PM) Peak Hour Traffic Volumes  
Signalized Intersection  
Stop Sign  
Project Site  
Planned Future Roadway  
Study Intersection



Figure 21  
Project Trip Assignment  
Cumulative Roadway Network — Phase 2



The addition of project traffic through Phase 1 would worsen average delay at the already deficient intersections, and would result in deficient operations for the side-street movement at the Deer Valley Road at Balfour Road intersection. Peak hour signal warrants would also be satisfied.

With the addition of traffic through Phase 2, no additional deficiencies were identified and operations of the already deficient intersections would continue to worsen.

## **Cumulative Condition**

In the cumulative condition, project impacts were identified at the following intersections; for all but two locations, as noted below, the impacts in the cumulative condition would occur with the Phase 1 project:

- Hillcrest Avenue at State Route 4 Eastbound Ramps (with Phase 1)
- Lone Tree Way at Davidson Drive (with Buildout Only)
- Deer Valley at Hillcrest Avenue/Davison Drive (with Phase 1)
- Lone Tree Way at Deer Valley Road (with Phase 2)
- Lone Tree Way at Hillcrest Avenue (with Phase 1)
- Lone Tree Way at SR 4 Eastbound Ramps (with Phase 1)
- Lone Tree Way at SR 4 Westbound Ramps (with Phase 1)
- Sand Creek Road at State Route 4 Eastbound Ramps (with Phase 1)
- Sand Creek Road at State Route 4 Westbound Ramps (with Phase 1)
- Balfour Road at Deer Valley Road (with Phase 1)
- Balfour Road at State Route 4 Eastbound Ramps (with Phase 1)

Moreover, the addition of Phase 1 project traffic in the cumulative condition would result in deficient operations of the Prewett Ranch Drive at Deer Valley Road; the addition of Phase 2 project traffic in the cumulative condition would result in deficient operations at the Lone Tree Way at Deer Valley Road intersection.

Construction of the Sand Creek Road extension to Dallas Ranch Road would shift traffic from Prewett Drive, resulting in better operations under project buildout conditions than the no project condition. At the Lone Tree Way at Deer Valley Road intersection, the connection of Sand Creek Road to Dallas Ranch Road would provide alternative travel routes for project traffic, shifting some project traffic away from the Lone Tree Way at Deer Valley Road intersection, reducing the project's cumulative impact to a less-than-significant level.

**Table 17: Existing Conditions Phasing Analysis Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Existing		Existing with Phase 1		Existing with Phase 2	
			Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS
5. Hillcrest Avenue/ SR 4 EB Ramps	Signal	AM PM	32 <b>90</b>	C <b>F</b>	33 <b>110</b>	C <b>F</b>	34 <b>119</b>	C <b>F</b>
22. Balfour Road/Deer Valley Road	SSSC	AM PM	14 (23) 10 (14)	B (C) B (B)	18 (31) 12 (18)	B (D) B (C)	21 ( <b>38</b> ) 13 (19)	C ( <b>E</b> ) B (C)

Notes:

1. Signal = signalized intersection; SSSC = side-street stop-controlled intersection

2. Average intersection delay is calculated for all signalized intersections using the HCM 6<sup>th</sup> Edition method for vehicles.

Source: Fehr & Peers, 2019

**Table 18: Near-Term Conditions Phasing Analysis Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Near-term without Project		Near-term with Phase 1		Near-term with Phase 2	
			Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS
5. Hillcrest Avenue/ SR 4 EB Ramps	Signal	AM PM	46 <b>121</b>	D <b>F</b>	50 <b>134</b>	D <b>F</b>	50 <b>138</b>	D <b>F</b>
12 Lone Tree Way/State Route 4 Eastbound Ramps	Signal	AM PM	24 <b>57</b>	C <b>E</b>	24 <b>57</b>	C <b>E</b>	24 <b>57</b>	C <b>E</b>
22. Balfour Road/Deer Valley Road	SSSC	AM PM	18 (33) 12 (21)	C (D) B (C)	24 ( <b>47</b> ) 15 (27)	C ( <b>E</b> ) B (D)	27 ( <b>55</b> ) 17 (31)	D ( <b>F</b> ) C (D)

Notes:

1. Signal = signalized intersection; SSSC = side-street stop-controlled intersection

2. Average intersection delay is calculated for all signalized intersections using the HCM 6<sup>th</sup> Edition method for vehicles.

Source: Fehr & Peers, 2019

**Table 19: Cumulative Conditions Phasing Analysis Peak Hour Intersection LOS Summary**

Intersection	Control <sup>1</sup>	Peak Hour	Cumulative without Project		Cumulative with Phase 1		Cumulative with Phase 2	
			Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS
5 Hillcrest Avenue/State Route 4 Eastbound Ramps	Signal	AM PM	<b>94</b> <b>227</b>	<b>F</b> <b>F</b>	<b>95</b> <b>231</b>	<b>F</b> <b>F</b>	<b>96</b> <b>233</b>	<b>F</b> <b>F</b>
6 Lone Tree Way/Davison Drive	Signal	AM PM	43 22	D C	49 23	D C	52 23	D C
7 Deer Valley Road/Hillcrest Avenue/Davison Drive	Signal	AM PM	<b>67</b> <b>107</b>	<b>E</b> <b>F</b>	<b>58</b> <b>95</b>	<b>E</b> <b>F</b>	<b>58</b> <b>96</b>	<b>E</b> <b>F</b>
10 Lone Tree Way/Deer Valley Road	Signal	AM PM	41 38	D D	48 44	D D	52 <b>56</b>	D <b>E</b>
11 Lone Tree Way/Hillcrest Avenue	Signal	AM PM	<b>81</b> <b>77</b>	<b>F</b> <b>E</b>	<b>82</b> <b>78</b>	<b>F</b> <b>F</b>	<b>82</b> <b>78</b>	<b>F</b> <b>F</b>
12 Lone Tree Way/State Route 4 Eastbound Ramps	Signal	AM PM	<b>97</b> <b>133</b>	<b>F</b> <b>F</b>	<b>98</b> <b>133</b>	<b>F</b> <b>F</b>	<b>98</b> <b>133</b>	<b>F</b> <b>F</b>
13 Lone Tree Way/State Route 4 Westbound Ramps/Jeffery Way	Signal	AM PM	<b>68</b> <b>87</b>	<b>E</b> <b>F</b>	<b>69</b> <b>87</b>	<b>E</b> <b>F</b>	<b>69</b> <b>88</b>	<b>E</b> <b>F</b>
15. Prewett Ranch Drive at Deer Valley Road	Signal	AM PM	<b>79</b> 23	<b>E</b> C	<b>93</b> 25	<b>F</b> C	<b>101</b> 27	<b>F</b> C
20. Sand Creek Road/SR 4 EB Ramps	Signal	AM PM	<b>81</b> <b>103</b>	<b>F</b> <b>F</b>	<b>86</b> <b>112</b>	<b>F</b> <b>F</b>	<b>88</b> <b>116</b>	<b>F</b> <b>F</b>
21. Sand Creek Road/SR 4 WB Ramps	Signal	AM PM	<b>56</b> 24	<b>E</b> C	<b>59</b> 26	<b>E</b> C	<b>60</b> 26	<b>E</b> C
22. Balfour Road/Deer Valley Road	SSSC	AM PM	<b>&gt; 150 (&gt; 180)</b> <b>98 (&gt; 180)</b>	<b>F (F)</b> <b>F (F)</b>	<b>&gt;150 (&gt;180)</b> <b>120 (&gt;180)</b>	<b>F (F)</b> <b>F (F)</b>	<b>&gt;180(&gt;180)</b> <b>129 (&gt;180)</b>	<b>F (F)</b> <b>F (F)</b>
23 Balfour Road/State Route 4 Eastbound Ramps	Signal	AM PM	43 <b>56</b>	D <b>E</b>	43 <b>57</b>	D <b>E</b>	43 <b>58</b>	D <b>E</b>

Notes:

1. Signal = signalized intersection; SSSC = side-street stop-controlled intersection

2. Average intersection delay is calculated for all signalized intersections using the HCM 6<sup>th</sup> Edition method for vehicles.

Source: Fehr & Peers, 2019

# Mitigation By Phase

## Existing

Mitigation measure implementation by phase under existing conditions is:

- Intersection 5 – Hillcrest Avenue at State Route 4 Eastbound Ramps – implement Mitigation Measure 1 with Phase 1.
- Intersection 22 – Balfour Road at Deer Valley Road – implement Mitigation Measure 2 with Phase 2.

## Near-Term

Mitigation measure implementation by phase under near-term conditions is:

- Intersection 5 – Hillcrest Avenue at State Route 4 Eastbound Ramps – implement Mitigation Measure 1 with Phase 1.
- Intersection 12 – Lone Tree Way/State Route 4 Eastbound Ramps – implement Mitigation Measure 5 with Phase 1.
- Intersection 22 – Balfour Road at Deer Valley Road – implement Mitigation Measure 2 with Phase 1.

## Cumulative Condition

Ten potential off-site intersection impacts were identified in the Cumulative condition with Phase 1; one new impact was identified with Phase 2 (Deer Valley at Lone Tree Way), and an impact was identified with Buildout; one impact would be eliminated with project buildout (Deer Valley at Lone Tree Way).

- Hillcrest Avenue at State Route 4 Eastbound Ramps – Implement Mitigation Measure 7 with Phase 1.
- Lone Tree Way at Davidson Drive – Implement Mitigation Measure 8 with Buildout.
- Deer Valley at Hillcrest Avenue/Davison Drive – Implement Mitigation Measure 9 with Phase 1.
- Lone Tree Way at Hillcrest Avenue– Implement Mitigation Measure 10 with Phase 1.
- Lone Tree Way at SR 4 Eastbound Ramps – Implement Mitigation Measure 11 with Phase 1.
- Lone Tree Way at SR 4 Westbound Ramps – Implement Mitigation Measure 12 with Phase 1.
- Sand Creek Road at State Route 4 Eastbound Ramps – Implement Mitigation Measure 13 with Phase 1.
- Sand Creek Road at State Route 4 Westbound Ramps – Implement Mitigation Measure 14 with Phase 1.
- Balfour Road at Deer Valley Road – Implement Mitigation Measure 15 with Phase 1.



- Balfour Road at State Route 4 Eastbound Ramps – Implement Mitigation Measure 16 with Phase 1.

In addition to the previously identified mitigation measures, one new impact was identified with Phase 1, and one new impact was identified with Phase 2.

**Impact Statement 17:** Intersection 10 – Lone Tree Way/Deer Valley Road

This intersection is projected to operate at LOS D prior to the addition of project traffic during the evening peak hour. The addition of project traffic through Phase 2 would result in LOS E operations. Based on the significance criteria, this is considered a **significant** impact.

**Mitigation Measure 17:** This intersection has been built to its ultimate configurations and no reconfigurations within the existing intersection cross-section that would result in acceptable operations were identified.

The Project Applicant shall construct the Sand Creek Road extension from Deer Valley Road to Dallas Ranch Road as a four lane roadway prior to the issuance of the 622<sup>nd</sup> residential building permit.

The construction of the four lane extension of Sand Creek Road between Deer Valley Road and Dallas Ranch Road would shift some project traffic from the intersection of Lone Tree Way at Deer Valley Road to Lone Tree Way at Dallas Ranch Road, and improve the operations of this intersection to an acceptable level through project buildout as shown in **Table 14**, reducing the project's impact to a **less-than-significant** level.

**Impact Statement 18:** Intersection 14 – Prewett Ranch Drive/Deer Valley Road

This intersection is projected to operate at LOS E prior to the addition of project traffic during the morning peak hour in the cumulative condition. The addition of project traffic through Phase 1 would worsen LOS E operations and increase traffic. Based on the significance criteria, this is considered a **significant** impact.

**Mitigation Measure 18:** This intersection has been built to its ultimate configurations and no reconfigurations within the existing intersection cross-section that would result in acceptable operations were identified.

If not already completed by others, the Project Applicant shall construct Sand Creek Road from the Kaiser Medical Center Entrance Roadway to the western boundary of the Dozier Libbey High School prior to the issuance of the 421<sup>st</sup> residential building permit for the project as a two-lane roadway (one lane in each direction) along the ultimate roadway alignment, connecting to the portion of

Sand Creek Road at Dozier Libbey High School to the constructed by others. The roadway would include a median, as well as one travel lane and a an eight-foot shoulder in each direction. Construction of that portion of Sand Creek Road would shift existing and future traffic and provide other travel routes for project traffic.

Construction of the aforementioned improvements would result in acceptable intersection operations through project buildout as shown in **Table 14**, reducing the project's impact to a ***less-than-significant*** level. Additionally, it would reduce the level of vehicle traffic on Prewett Ranch Road, as presented in **Table 15**.

As these connections would provide benefit for other development projects in the area, the Project Applicant may enter into a reimbursement agreement with the City of Antioch for improvement costs beyond the project's fair share. Should the Sand Creek Road extension be added to the ECCRFFA program, the Project Applicant shall build additional ultimate improvements to the extent they will be reimbursed by ECCRFFA. Construction of this improvement would reduce the project impact to a ***less-than-significant*** level.



## 8. Freeway Analysis

The freeway analysis was conducted under existing, near-term and cumulative conditions based on the methodology outlined in Chapter 1 to determine travel speeds along the State Route 4 corridor from Lone Tree Way/A Street to Balfour Road and State Route 160, north of State Route 4.

### Existing Conditions

Mainline traffic counts were conducted on State Route 4 south of Balfour Road in January 2019. Traffic volumes at the interchanges along the corridor were used to estimate traffic volumes on the mainline segments from south of Balfour Road to west of Lone Tree Way/A Street. Project traffic volumes were then considered. The traffic volumes and number of travel lanes were used to calculate vehicle speeds using the HCM 6<sup>th</sup> Edition method, which were then used to calculate the delay index. The results were verified through travel of the corridor during peak hours.

The results are presented in **Table 20** for the AM Peak Hour and **Table 21** for the PM peak hour. State Route 4 from south of Balfour Road through Lone Tree Way/A Street generally operates at free-flow speeds during both the morning and evening peak hours. SR 160 also operates with minimal congestion during peak hours. With the addition of project traffic in the existing condition, all mainline freeway segments in the immediate study area would continue to operate within the established service objective and the project's impact to freeway operations in the immediate project vicinity in the existing condition is considered less-than-significant. However, there are greater levels of congestion on State Route 4 further west of Lone Tree Way/A Street and the project would add vehicle traffic to these roadway segments. The project's percentage of overall traffic would be minimal, but it would contribute to worsening levels of congestion along the State Route 4 corridor.

**Table 20: Existing Conditions Freeway Operations Summary – AM Peak Hour**

Segment	Direction	Existing		Existing with Project	
		Volume	Delay Index	Volume	Delay Index
1. State Route 4, west of Lone Tree Way/A Street	EB	3,325	1.00	3,381	1.00
	WB <sup>1</sup>	3,931	1.00	4,085	1.00
2. State Route 4, west of Hillcrest Avenue	EB	2,931	1.00	2,946	1.00
	WB <sup>1</sup>	3,248	1.00	3,253	1.00
3. State Route 4, west of State Route 160	EB	2,472	1.00	2,484	1.00
	WB	2,710	1.00	2,715	1.00
4. State Route 4, west of Laurel Road	EB	2,756	1.00	2,761	1.00
	WB	3,318	1.00	3,330	1.00
5. State Route 4, north of Lone Tree Way	SB	2,800	1.01	2,805	1.01
	NB	2,909	1.02	2,921	1.02
6. State Route 4, north of Sand Creek Road	SB	2,461	1.00	2,496	1.00
	NB	2,837	1.01	2,851	1.01
7. State Route 4, north of Balfour Road	SB	2,022	1.05	2,022	1.05
	NB	2,036	1.05	2,036	1.05
8. State Route 4, south of Balfour Road	SB	1,201	1.20	1,275	1.32
	NB	940	1.03	968	1.04
9. State Route 160, north of State Route 4	NB	1,284	1.00	1,308	1.00
	SB	960	1.00	970	1.00

Notes:

1. AM peak hour analysis reflects operation of the HOV lane which carries approximately 13 percent of traffic volumes, reducing the number of mixed-flow lanes available during the AM peak hour.

Source: Fehr & Peers, 2019.

**Table 21: Existing Conditions Freeway Operations Summary – PM Peak Hour**

Segment	Direction	Existing		Existing with Project	
		Volume	Delay Index	Volume	Delay Index
1. State Route 4, west of Lone Tree Way/A Street	EB <sup>1</sup>	5,977	1.06	6,151	1.08
	WB	4,334	1.00	4,444	1.00
2. State Route 4, west of Hillcrest Avenue	EB <sup>1</sup>	5,267	1.02	5,313	1.02
	WB	3,771	1.00	3,771	1.00
3. State Route 4, west of State Route 160	EB	4,383	1.00	4,391	1.00
	WB	3,506	1.00	3,520	1.00
4. State Route 4, west of Laurel Road	EB	4,361	1.02	4,375	1.02
	WB	2,957	1.00	2,965	1.00
5. State Route 4, north of Lone Tree Way	SB	3,731	1.11	3,745	1.12
	NB	2,990	1.02	2,998	1.02
6. State Route 4, north of Sand Creek Road	SB	3,205	1.03	3,234	1.04
	NB	2,947	1.02	2,991	1.02
7. State Route 4, north of Balfour Road <sup>3</sup>	SB	2,058	1.06	2,028	1.05
	NB	2,235	1.11	2,235	1.11
8. State Route 4, south of Balfour Road	SB	1,015	1.05	1,069	1.08
	NB	1,431	1.82	1,518	2.31
9. State Route 160, north of State Route 4	NB	1,143	1.00	1,159	1.00
	SB	1,670	1.00	1,698	1.00

Notes:

1. PM peak hour analysis reflects operation of the HOV lane which carries approximately 13 percent of traffic volumes, reducing the number of mixed-flow lanes available during the PM peak hour.

Source: Fehr & Peers, 2019.

## Near-Term

Near-term freeway forecasts were developed based on the same method used to develop the near-term intersection forecasts, both without and with the project. Operations were evaluated using the same methods described in Chapter 1. No freeway improvements over the existing condition were considered in the evaluation of the near-term condition. The Near-term without and with Project analysis results are presented in **Table 22** and **Table 23** for the AM and PM peak hours, respectively, based on the estimates of near-term traffic volumes, plus estimates of project traffic.

**Table 22: Near-term Conditions Freeway Operations Summary – AM Peak Hour**

Segment	Direction	Near-Term		Near-Term with Project	
		Volume	Delay Index	Volume	Delay Index
1. State Route 4, west of Lone Tree Way/A Street	EB	3,658	1.00	3,719	1.00
	WB <sup>1</sup>	4,660	1.01	4,814	1.01
2. State Route 4, west of Hillcrest Avenue	EB	3,204	1.00	3,224	1.00
	WB <sup>1</sup>	3,760	1.00	3,780	1.00
3. State Route 4, west of State Route 160	EB	2,724	1.00	2,741	1.00
	WB	3,189	1.00	3,209	1.00
4. State Route 4, west of Laurel Road	EB	3,049	1.00	3,059	1.00
	WB	3,785	1.01	3,812	1.01
5. State Route 4, north of Lone Tree Way	SB	3,124	1.03	3,134	1.03
	NB	3,270	1.04	3,297	1.04
6. State Route 4, north of Sand Creek Road	SB	2,737	1.01	2,742	1.01
	NB	3,232	1.04	3,247	1.04
7. State Route 4, north of Balfour Road	SB	2,487	1.00	2,516	1.00
	NB	2,297	1.00	2,305	1.00
8. State Route 4, south of Balfour Road	SB	1,602	<b>3.02</b>	1,676	<b>3.90</b>
	NB	1,130	1.12	1,158	1.00
9. State Route 160, north of State Route 4	NB	1,436	1.00	1,460	1.00
	SB	1,165	1.00	1,175	1.00

Notes:

1. AM peak hour analysis reflects operation of the HOV lane which carries approximately 13 percent of traffic volumes, reducing the number of mixed-flow lanes available during the AM peak hour.

Source: Fehr & Peers, 2019.

**Table 23: Near-Term Conditions Freeway Operations Summary – PM Peak Hour**

Segment	Direction	Near-Term		Near-Term with Project	
		Volume	Delay Index	Volume	Delay Index
1. State Route 4, west of Lone Tree Way/A Street	EB <sup>1</sup>	6,762	1.17	6,950	1.21
	WB	4,901	1.00	5,003	1.00
2. State Route 4, west of Hillcrest Avenue	EB <sup>1</sup>	5,882	1.06	5,942	1.06
	WB	4,196	1.00	4,198	1.00
3. State Route 4, west of State Route 160	EB	4,952	1.00	4,974	1.00
	WB	3,920	1.00	3,936	1.00
4. State Route 4, west of Laurel Road	EB	5,026	1.05	5,054	1.05
	WB	3,401	1.00	3,411	1.00
5. State Route 4, north of Lone Tree Way	SB	4,229	1.31	4,257	1.33
	NB	3,501	1.07	3,511	1.07
6. State Route 4, north of Sand Creek Road	SB	3,599	1.09	3,613	1.09
	NB	3,405	1.06	3,415	1.06
7. State Route 4, north of Balfour Road	SB	2,465	1.00	2,485	1.00
	NB	2,807	1.01	2,832	1.01
8. State Route 4, south of Balfour Road	SB	1,330	1.46	1,384	1.63
	NB	1,909	<b>9.20</b>	1,996	<b>12.70</b>
9. State Route 160, north of State Route 4	NB	1,275	1.00	1,291	1.00
	SB	1,868	1.00	1,896	1.00

Notes:

1. PM peak hour analysis reflects operation of the HOV lane which carries approximately 13 percent of traffic volumes, reducing the number of mixed-flow lanes available during the PM peak hour.

Source: Fehr & Peers, 2019.

In the near-term condition, the segment of State Route 4 south of Balfour Road would experience increased congestion with a delay index greater than 2.5 in the southbound direction during the morning peak hour and in the northbound direction during the PM peak hour. The project would worsen operations on this segment, but would not result in additional study-segments to degrade beyond the established standard. Additionally the project would contribute to worsening levels of congestion on State Route 4 further west of the study area.

# Cumulative

Cumulative freeway forecasts were developed based on the same method used to develop the cumulative intersection forecasts, both without and with the project. Operations were evaluated using the same methods described in Chapter 1. The Cumulative without and with Project analysis results are presented in **Table 24** and **Table 25** for the AM and PM peak hours, respectively, based on the estimates of cumulative traffic volumes, plus estimates of project traffic. In the cumulative condition, all freeway segments in the study area are projected to continue operating within the MTSO, as planned improvements to SR 4 south of Balfour Road would improve operations of the segment between Marsh Creek Road and Balfour Road.

**Table 24: Cumulative Conditions Freeway Operations Summary – AM Peak Hour**

Segment	Direction	Cumulative		Cumulative with Project	
		Volume	Delay Index	Volume	Delay Index
1. State Route 4, west of Lone Tree Way/A Street	EB	4,320	1.00	4,390	1.00
	WB <sup>1</sup>	5,250	1.02	5,404	1.03
2. State Route 4, west of Hillcrest Avenue	EB	3,640	1.00	3,675	1.00
	WB <sup>1</sup>	4,390	1.01	4,410	1.01
3. State Route 4, west of State Route 160	EB	2,890	1.00	2,922	1.00
	WB	3,550	1.00	3,570	1.00
4. State Route 4, west of Laurel Road	EB	3,250	1.00	3,275	1.00
	WB	4,310	1.01	4,337	1.01
5. State Route 4, north of Lone Tree Way	SB	3,190	1.03	3,215	1.03
	NB	3,850	1.15	3,877	1.16
6. State Route 4, north of Sand Creek Road	SB	2,620	1.01	2,645	1.01
	NB	3,450	1.06	3,477	1.07
7. State Route 4, north of Balfour Road	SB	2,370	1.00	2,444	1.00
	NB	2,560	1.01	2,584	1.01
8. State Route 4, south of Balfour Road	SB	1,420	1.00	1,494	1.00
	NB	1,520	1.00	1,278	1.00
9. State Route 160, north of State Route 4	NB	1,600	1.00	1,624	1.00
	SB	1,200	1.00	1,210	1.00

Notes:

1. AM peak hour analysis reflects operation of the HOV lane which carries approximately 13 percent of traffic volumes, reducing the number of mixed-flow lanes available during the AM peak hour.

Source: Fehr & Peers, 2019.



**Table 25: Cumulative Conditions Freeway Operations Summary – PM Peak Hour**

Segment	Direction	Cumulative		Cumulative with Project	
		Volume	Delay Index	Volume	Delay Index
1. State Route 4, west of Lone Tree Way/A Street	EB <sup>1</sup>	8,290	1.87	8,464	2.03
	WB	6,980	1.07	7,092	1.08
2. State Route 4, west of Hillcrest Avenue	EB <sup>1</sup>	7,440	1.37	7,502	1.39
	WB	6,010	1.02	6,022	1.02
3. State Route 4, west of State Route 160	EB	5,170	1.01	5,194	1.01
	WB	5,420	1.01	5,446	1.01
4. State Route 4, west of Laurel Road	EB	5,070	1.05	5,100	1.05
	WB	4,720	1.03	4,738	1.03
5. State Route 4, north of Lone Tree Way	SB	4,320	1.37	4,350	1.39
	NB	4,780	1.83	4,798	1.86
6. State Route 4, north of Sand Creek Road	SB	4,220	1.31	4,250	1.32
	NB	4,070	1.23	4,088	1.24
7. State Route 4, north of Balfour Road	SB	2,830	1.01	2,873	1.01
	NB	3,240	1.04	3,314	1.04
8. State Route 4, south of Balfour Road	SB	1,760	1.00	1,814	1.00
	NB	2,400	1.00	2,487	1.00
9. State Route 160, north of State Route 4	NB	1,600	1.00	1,616	1.00
	SB	2,200	1.00	2,230	1.00

Notes:

1. PM peak hour analysis reflects operation of the HOV lane which carries approximately 13 percent of traffic volumes, reducing the number of mixed-flow lanes available during the PM peak hour.

Source: Fehr & Peers, 2019.

The project would increase traffic on freeways in the study area, it would worsen the operations of SR 4 south of Balfour Road, resulting in a significant impact in the near-term condition. The project would also contribute to worsening levels of congestion on State Route 4 further west of the study area.

#### **Impact Statement 19: Regional Freeway Facilities**

In the near-term condition, the segment of State Route 4 south of Balfour Road would experience increased congestion with a delay index greater than 2.5 in the southbound direction during the morning peak hour and in the northbound direction during the PM peak hour. The project would worsen operations on this roadway segment resulting in a **significant impact**. Additionally, the project would contribute to

worsening levels of congestion on other freeway segments, including State Route 4 further west of the study area (between Loveridge Road and Morello Avenue) by adding traffic to freeway segments where CCTA has documented delay indices higher than 2.5, which is cumulatively **significant** based on the significance criteria.

**Mitigation Measure 19:** CCTA plans to widen State Route 4 between Marsh Creek Road and Balfour Road to provide two additional travel lanes (for a total of four – two in each direction). Participation in the ECCRFFA program would constitute a fair-share payment towards this planned improvement and would reduce this impact to a less-than-significant level.

No additional capacity enhancing projects are planned on State Route 4 from in the vicinity of the Lone Tree Way/A Street to the west. CCTA has developed State Route 4 Integrated Corridor Management (ICM) plan that includes strategies such as adaptive ramp metering, incident management, traffic and transit information systems, traffic arterial and transit information systems, connected vehicle technologies, and integration with the Interstate 80 corridor ICM to better manage traffic flows along the corridor.

Although the Project Applicant shall pay their fair share towards regional transportation improvements through the participation in the ECCRFFA program, the ICM improvement is not part of the fee program and full funding for that improvement has not been identified. Additionally, as the widening of State Route 4 between Marsh Creek Road and Balfour Road cannot be assured through the payment of fees, and the effectiveness of the ICM project is uncertain, the project impact to the regional freeway system would remain **significant and unavoidable**.

## 9. Site Plan Review

This chapter analyzes site access and internal circulation for vehicles, pedestrians, bicycles, and emergency vehicles based on the site plan presented previously on **Figure 2**.

### Vehicular Site Access and Circulation

Access to the project site would be provided by new roadway connections to the Sand Creek Road extension that would be constructed as part of the project connecting the terminus of Dallas Ranch Road to the existing Sand Creek Road connection at Deer Valley Road. As proposed, Sand Creek Road and Street B would be four-lane roadways with the remaining roadways within the project site developed as two-lane roadways. The proposed street network is shown on **Figure 22**.

Sand Creek Road would provide either a 96-foot right of way (when development is proposed on one side of the street) or a 112-foot right-of-way (when development is proposed on both sides of the street). The cross-section would generally include a 6-foot sidewalk, 10-foot landscape buffer, 8-foot bicycle lane, and two 12-foot travel lanes in each direction plus a 16-foot median that would allow for turn pockets to be provided at intersections. Along some portions of the street section, additional right-of-way to provide landscaping outside the public right-of-way is also proposed on each side of the street.

Deer Valley Road along the project frontage would be improved to provide sidewalks, landscape buffer, bicycle lane, and additional travel lanes to match the cross-section on the opposite side of the roadway. An additional landscape setback is also proposed in the vicinity of the village center.

Other major streets through the project site would provide one vehicle lane in each direction in addition to sidewalks, parking lane and landscaping within a 56-foot right-of-way. The ultimate design would conform to City Code requirements.

Typical internal local residential streets would feature two travel lanes within rights of ways ranging from 37 to 56 feet in width. Except for private lanes/alleys, local streets would include on-street vehicle parking, either on one or both sides of the street, as well as four to five-foot sidewalks on both sides of the streets. Private alleys or courts may be used to access residential units and would be allowed to be narrower than public through streets; such alleys or courts would not be anticipated to offer on-street parking or sidewalks. A small number of local residential streets would abut open space areas with readily accessible trail systems, and therefore, include a two-foot curb and gutter without parking lanes or sidewalks. These street cross-sections do not meet City Code Requirements and would need to be designated private streets.

Projected peak hour turning movement forecasts the major roadway connections are presented on **Figure 22**, representative of cumulative conditions. As shown, most intersections are projected to carry low volumes of traffic. Analysis was conducted for the primary internal intersections under both traffic signal and roundabout control as presented in **Table 26**. As shown, internal intersections are projected to operate at acceptable levels under either roundabout or traffic signal control.

**Table 26: Cumulative With Project Conditions Internal Intersection LOS Summary**

Intersection	Peak Hour	Roundabout		Traffic Signal	
		Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS
25. Sand Creek Road/B Street	AM	7	A	17	B
	PM	9	A	17	B
26. Sand Creek Road/Village 3	AM	6	A	29	C
	PM	8	A	29	C
27. Sand Creek Road/A Street	AM	7	A	18	B
	PM	8	A	19	B
28. Sand Creek Road/Street D	AM	6	A	25	C
	PM	7	A	29	C
29. B Street/C Street	AM	4	A	N/A	N/A
	PM	5	A	N/A	N/A
30. Sand Creek Road/Deer Valley	AM	15	B	17	B
	PM	15	B	14	B

Notes:

1. Signal = signalized intersection

2. Delay is based on HCM 6<sup>th</sup> Edition method for vehicles.

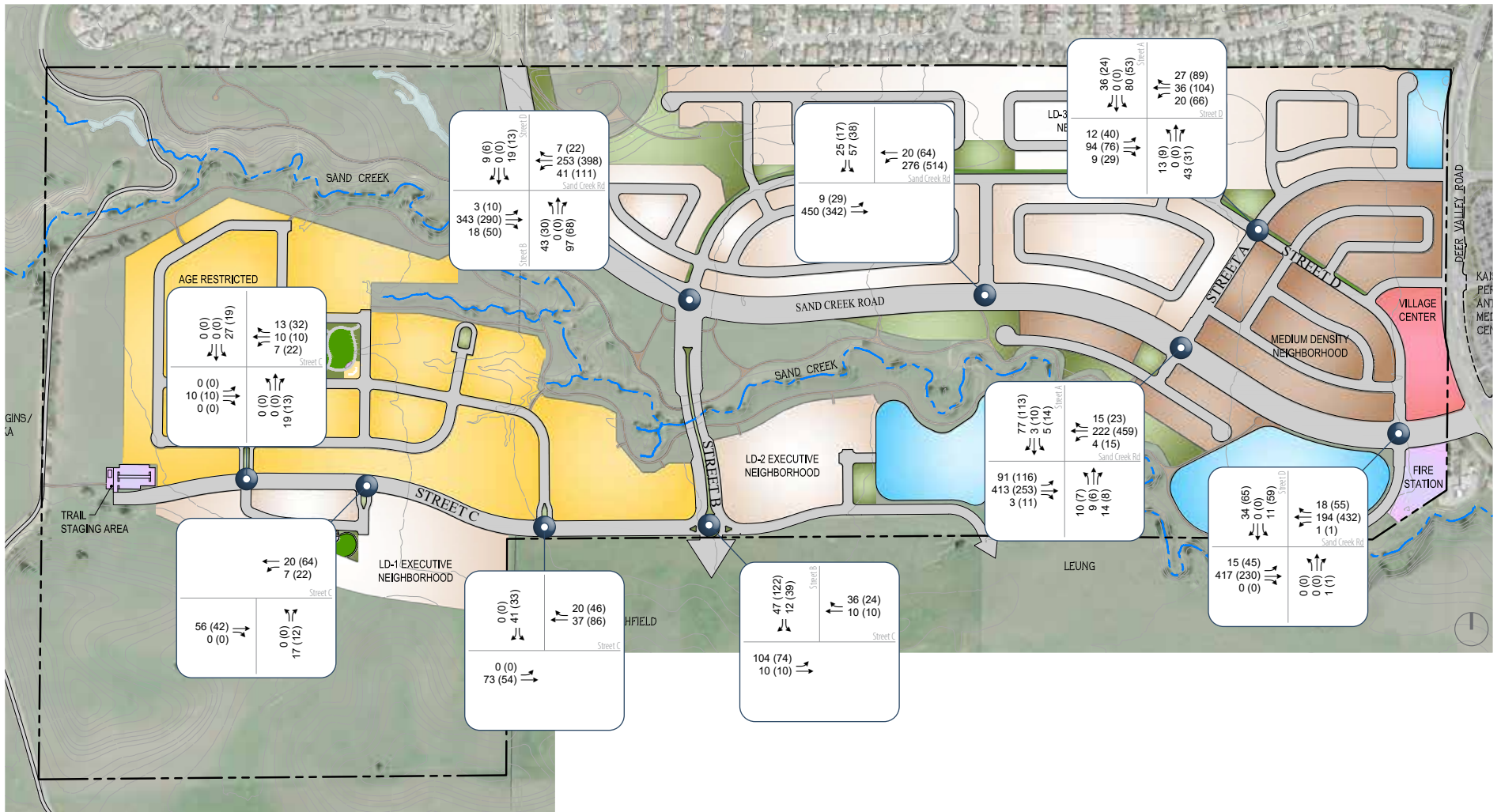
Source: Fehr & Peers, 2019.

## Emergency Vehicle Access

Several factors determine whether a project has sufficient access for emergency vehicles, including:

1. Number of access points (both public and emergency access only)
2. Width of access points
3. Width of internal roadways

Based on the *2016 California Fire Code* as amended by Contra Costa County Ordinance 2016-23, the minimum number of access roads serving residential development(s) shall be based upon the number of dwelling units served as follows:



XX (YY) AM (PM) Peak Hour Traffic Volumes

Cumulative AM and PM Peak Hour Volumes with Project

Figure 22

- Multiple Family Residential Projects having more than 100 dwelling units should be provided with two separated and approved fire apparatus access roads (D106.1)
- Development of one or two-family dwellings where the number of dwelling units exceed 30 shall be provided with two separate and approved fire apparatus access roads; where there are more than 30-dwelling units on a single public or private fire apparatus access road and all dwelling units are equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3 of the *California Fire Code*, access from two directions shall not be required (D107.1)

Access to the project would be provided from new roadway connections from Deer Valley Road via Street A, Street D and Street B and an extension of Sand Creek Road connecting to Dallas Ranch Road, as shown previously on **Figure 22**. Access to Villages 1 through 8 would be provided from multiple locations, meeting or exceeding the fire code requirements, even in Phase 1 and Phase 2 conditions, prior to the extension of Sand Creek Road to Dallas Ranch Road.

Access to Villages 9, 10, 11 and 12 with a total of 555 units would be restricted to a single public access roadway. The unit count by village is shown on **Figure 23**. Secondary emergency vehicle access to Village 9 (65-units) would be provided from a 20-foot wide EVA trail connection between Village 9 and Village 3. Access to Villages 10, 11 and 12 (total of 490 units) would be limited to a single location – if an incident blocked the intersection of Street C/Street B, emergency vehicle response could be impaired. The proposed EVA plan should be reviewed by the Contra Costa County Fire Protection District to ensure that fire truck and other emergency vehicle turn radius and roadway design elements are incorporated into the final plan.

**Recommendation:** Villages 9, 10, 11 and 12 are proposed to be developed with up to 555 homes with a single access location from Street B. A secondary EVA trail connection is provided to Village 9. Based on Fire Code requirements, two fire access roads may be required to Villages 10, 11 and 12.

The Contra Costa County Fire Protection District should review the proposed circulation plan to ensure Fire Code and emergency access requirements are met.

Cross-sections for the proposed streets within the project site were reviewed. All street sections provide a minimum of 20-feet of clearway (meaning no obstructions in terms of parked vehicles, landscaping, etc.), such that sufficient width is provided for emergency vehicle access and circulation.





	VILLAGE 1 (MD) - 59 UNITS
	VILLAGE 2 (MD) - 94 UNITS
	VILLAGE 3 (MD) - 59 UNITS
	VILLAGE 4 (LD-3) - 132 UNITS
	VILLAGE 5 (LD-3) - 55 UNITS
	VILLAGE 6 (LD-3) - 77 UNITS
	VILLAGE 7 (LD-3) - 94 UNITS
	VILLAGE 8 (LD-3) - 52 UNITS
	VILLAGE 9 (LD-2) - 65 UNITS
	VILLAGE 10 (AA) - 254 UNITS
	VILLAGE 11 (AA) - 168 UNITS
	VILLAGE 12 (LD-1) - 68 UNITS
	TOTAL - 1,177 UNITS
	PARKS / LANDSCAPE
	RESTRICTED DEVELOPMENT

Site Plan Source: Carlson, Barbee & Gibson, Inc., Nov. 20, 2018

Figure 23

## Unit Count by Village



## Pedestrian Access and Circulation

Several roadway types are proposed within the development, including arterial, collector, local and hillside roadways. Arterial roadways would provide a minimum six-foot sidewalk on both sides of the street, except where a parallel Class I trail is provided. Collector and local roadways would provide a five-foot sidewalk on both sides of the street where development is proposed; if development would only occur on one side of the street, the sidewalk would be placed adjacent to development, with a Class I trail provided on the opposite side of the street. Sidewalks on the hillside roadways are proposed to be four-feet. The proposed sidewalk network would connect to the site to adjacent developments, providing continuous pedestrian connections in the area.

The project would also construct a number of off-street trails, ranging from a four-foot natural trail to a 10-foot asphalt trail with stabilized shoulders to accommodate emergency vehicle access.

**Recommendation:** As site plans for individual neighborhoods are developed pedestrian desire lines should be assessed and marked-crosswalks installed at key uncontrolled pedestrian crossing locations, such as at trail crossings and park connections.

Signalized intersections constructed as part of the project should be designed to provide crosswalks, pedestrian actuation, and bicycle detection. At roundabouts to be constructed as part of the project, appropriate pedestrian and bicycle crossing treatments shall be provided.

## Bicycle Access and Circulation

Class II bicycle lanes would be constructed on Sand Creek Road, Deer Valley Road, and Streets A, B and C. A number of off-street trails would also be constructed.

The on-street Class II bicycle facilities are proposed to provide eight-foot bicycle lanes adjacent to 12-foot or 13-foot travel lanes.

**Recommendation:** As vehicle speeds could exceed 25-miles per hour on four lane roadways, consider reallocating the pavement cross-section to provide a painted buffer between the bicycle lanes and the vehicular travel way. Reducing the travel lane width to 11-feet each would allow for a seven-foot bicycle lane and a three-foot buffer between the bicycle lanes and the vehicular travel-way on the proposed arterial streets.

Bicycle detection should be incorporated into new traffic signals in the area.

Paved shared use trails should be at least 10-feet wide with a two-foot shoulder on each side. Unpaved footpaths should be between three and six feet. Should unpaved trails be open to equestrians and/or bicyclist, additional width and design treatments would be required.

## Transit Access Adjacent to Site

Transit service is provided by Tri Delta Transit, with routes along Dallas Ranch Road, Prewett Ranch Drive, and Deer Valley Road, connecting to Kaiser, in the project area. A BART station is located approximately four miles from the site in the vicinity of Hillcrest Avenue at State Route 4, and an additional station may be constructed within the median of State Route 4 between Lone Tree Way and Sand Creek Road, approximately 2.5 to four miles east of the project site. Tri Delta Transit has indicated that it does not plan to provide transit service to the site.

**Recommendation:** As the final site plan is developed, consult with Tri Delta Transit to determine if transit facilities should be provided throughout the site to accommodate potential future service changes. Consider providing pedestrian passages through cul-de-sacs and other potential barriers to minimize pedestrian walking distances to future transit stops. Tri Delta Transit is currently piloting a door-to-door microtransit service for select neighborhoods in Antioch and Pittsburg. If successful, the Project Applicant should work with Tri Delta Transit to expand that service to the project site.

## Parking

Two enclosed parking spaces for each residential unit would be provided. Some homes would also have driveways where vehicles could be parked. For neighborhoods where on-street parking is not provided, guest parking would be provided at a rate of one space for every five units. Parking requirements for single-family detached homes require two enclosed parking spaces plus one guest parking space per each unit. Parking requirements for single-family attached homes require two parking spaces per unit, one of which must be enclosed, plus one guest parking space per each five units. For the Village Center, parking requirements are consistent with the City of Antioch municipal code. A trail staging area parking lot is also proposed on the western end of C Street.



**Recommendation:** Provide sufficient parking to meet City of Antioch parking requirements based on the final unit count and design.

## CEQA Checklist Review

This section provides a summary of the potential project impacts related to bicycles, pedestrians, and transit based on the discussions in previous chapters as compared to the significance criteria outlined in Chapter 1, and summarized for each topic area, as presented in **Table 27**.

**Table 27: CEQA Checklist Review**

Significance Criteria	Discussion	Mitigation
<b><i>A pedestrian impact is considered significant if the project would:</i></b>		
Disrupt existing pedestrian facilities	Pedestrian access is not currently provided along the west side of Deer Valley Road, such that pedestrian access in the area is not expected to be disrupted during the project construction phase. Additionally, preparation of a construction management (Mitigation Measure 3) plan would reduce the potential for disruptions to existing pedestrian facilities during the project construction phase.	None required.
	Project mitigation measures were reviewed for their potential impact to pedestrians. Widening of one intersection beyond the already planned cross-sections is could occur as part of cumulative mitigation measures at intersection 12, which would increase the pedestrian crossing distance. No pedestrian facilities are proposed to be removed as part of project mitigation.	None required.
Interfere with planned pedestrian facilities	The project would construct pedestrian facilities along all roadways within the project site, completing the sidewalk network in this area. Insufficient details are	<b>Mitigation Measure 20:</b> As the final site plan is developed, provide sidewalk and intersection crossing designs consistent with City requirements. Implementation of this



**Table 27: CEQA Checklist Review**

Significance Criteria	Discussion	Mitigation
	provided to review potential pedestrian crossing locations. <b>(Impact 20)</b>	measure would reduce the impact to a <b>less-than-significant</b> level.
Create inconsistencies with adopted pedestrian system plans, guidelines, policies, or standards	Sidewalks along the project boundary and through the project site would be constructed to current City standards.	None required.
<b>A bicycle impact is considered significant if the project would:</b>		
Disrupt existing bicycle facilities	Existing Class II bicycle facilities are provided in the immediate vicinity of the project site on Deer Valley Road. The project does not propose to eliminate existing bicycle facilities in the vicinity of project. Additionally, preparation of a construction management (Mitigation Measure 3) plan would reduce the potential for disruptions to existing bicycle facilities during the project construction phase.	None required.
	Mitigation measures proposed as mitigation for project impacts were reviewed for their potential impact to bicyclists. No intersection widening beyond the already planned cross-sections are proposed as project mitigation where bicycle facilities are provided and no bicycle facilities would be removed as part of project mitigation.	None required.
Interfere with planned bicycle facilities	Class II bicycle facilities would be provided along all arterial roadways within the project site. Class I facilities will also be provided throughout the project site. Insufficient details are provided to review potential bicycle crossing locations. <b>(Impact 21)</b>	<b>Mitigation Measure 21:</b> As the final site plan is developed, provide bicycle facility and intersection crossing designs consistent with City requirements. Implementation of this measure would reduce the impact to a <b>less-than-significant</b> level.



**Table 27: CEQA Checklist Review**

Significance Criteria	Discussion	Mitigation
Create inconsistencies with adopted bicycle system plans, guidelines, policies, or standards	Bicycle detection at the signalized intersections along the project frontage and within the project site, is required. <b>(Impact 22)</b>	<b>Mitigation 22:</b> Install bicycle detection as part of the signal modifications to the intersections of Deer Valley Road with Wellness Way and Sand Creek Road, as well as at any new traffic signals constructed as part of the project. Implementation of this measure would reduce the impact to a <b>less-than-significant</b> level.
<b><i>A transit impact is considered significant if the project would:</i></b>		
The project interferes with existing transit facilities or precludes the construction of planned transit facilities.	The project would not interfere with existing transit service in the area. Tri Delta Transit does not currently plan to provide transit serve to the area.	None Required.
<b><i>Other Transportation Effects not addressed in other Chapters</i></b>		
An impact could occur if the project conflicts or is inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	This section of the CEQA guidelines relates to the assessment of vehicle miles of travel generated by the project. An assessment of this metric is detailed in Chapter 10 for informational purposes only as the neither City of Antioch nor CCTA has adopted thresholds of significance related to VMT. Additionally, agencies are not required to complete VMT assessments until July 2020.	This analysis was prepared for informational purposes only and no findings of significance were made.





**Table 27: CEQA Checklist Review**

Significance Criteria	Discussion	Mitigation
An impact could occur if the project substantially increases traffic hazards due to a geometric design feature (e.g. sharp curves or dangerous intersections) or incompatible uses.	An increase in hazardous road conditions could occur if the site circulation design does not meet City of Antioch standards or the project adds traffic to a roadway that does not meet current design standards. Roadways within the project site would be designed to meet City of Antioch standards.	<p><b>Mitigation Measure 23:</b> The Project Applicant shall construct improvements on Deer Valley Road between Sand Creek Road and Balfour Road, which could include roadway widening to provide shoulders, and warning signage and flashing beacons in advance of curves. Implementation of this measure would reduce the impact to a <b>less-than-significant</b> level.</p> <p><b>Mitigation Measure 24:</b> Implement Mitigation Measure 18. Prior to the completion of the Phase 1 project, construct Sand Creek Road between Kaiser Medical Center and Dozier-Libbey High School as a two-lane roadway with a median, travel lanes (one in each direction) and shoulder (8-feet on both sides of street).</p>
	The project would add traffic to Deer Valley Road south of the project site which is currently an unimproved rural roadway. <b>(Impact 23)</b>	
	The project would add through traffic on Prewett Ranch Drive along the frontage of the Diablo Vista Elementary School, increasing conflicts between school traffic and through traffic. Additionally, it would contribute to an increase of vehicle traffic on Prewett Ranch Drive between Grass Valley Way and Hillcrest Avenue where front-on housing is located. <b>(Impact 24)</b>	As this connection would provide benefit for other development projects in the area, the Project Applicant may enter into a reimbursement agreement with the City of Antioch for improvement costs beyond the projects fair share. Should the Sand Creek Road extension be added to the ECCRFFA program and if the Project Applicant constructs all four lanes, regional fee credit could be sought. Construction of this improvement would reduce the project impact to a <b>less-than-significant</b> level.
An impact could occur if the project results in inadequate emergency access	Access to the northern portion of the site is proposed from numerous roadways. Access to the southern neighborhoods is provided from a single roadway connection, with secondary Emergency Vehicle Access Locations.	None Required.

Source: Fehr & Peers, 2019.

## 10. Vehicle Miles of Travel

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) has updated California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. Draft guidelines were developed in August 2014, with updated draft guidelines prepared January 2016, which incorporated public comments from the August 2014 guidelines. OPR released final proposed Guidelines on November 27, 2017, with an associated Technical Advisory Document on Evaluating Transportation Impacts in CEQA dated December 2018. The updated guidelines were finalized in January 2019 by the Natural Resources Agency, which includes a new Section 15064.3 on VMT analysis and thresholds for land use developments. New Guidelines section 15064.3 states that they do not take effect until July 1, 2020 unless the lead agency adopts them earlier. Neither the City of Brentwood nor the Contra Costa Transportation Authority has established any standards or thresholds on VMT. Therefore, the new guidelines have not yet been adopted and are not in effect at this time.

Since there are no standards in effect on VMT analysis, a preliminary assessment of the vehicle miles of travel (VMT) generated by the proposed project was prepared for informational and disclosure purposes only. No determination on the significance of VMT impacts is made in this document since none is legally required.

### CEQA Guidelines

Changes to Appendix G of the CEQA guidelines were finalized in January 2019, with methods for evaluating transportation impacts detailed in the *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018)<sup>11</sup> The following provides the information relevant to this project:

#### **Text of Amendments to Appendix G**

*b) For a land use project, would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)(1)?*

#### **(b) Criteria for Analyzing Transportation Impacts.**

**(1) Land Use Projects.** Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant

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<sup>11</sup> Full document can be found here:  
[http://opr.ca.gov/docs/20190122-743\\_Technical\\_Advisory.pdf](http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf)

transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be considered to have a less than significant transportation impact. For office uses, developments that would result in VMT 15 percent below **existing** regional VMT per employee (work tour or home-based work) would be considered less than significant.

Local-serving retail may be less than significant (projects less than 50,000 square feet). Retail which increases VMT compared to previous shopping patterns may be considered significant.

As neither the City of Antioch nor the Contra Costa Transportation Authority (CCTA) have established thresholds, and the new guidelines have not yet been adopted, this assessment is prepared for informational purposes only. This assessment focuses on the residential component of the project only as the proposed commercial uses are unknown.

## Analysis Methods

To conduct the VMT assessment, Fehr & Peers used the CCTA travel demand model as well as information from the Metropolitan Transportation Commission (MTC). The CCTA model was used to estimate average trip lengths for the proposed project, while MTC data<sup>12</sup> was used to establish average trip lengths for existing residential uses in Antioch. The existing average trip lengths for the City of Antioch, Contra Costa County and the Bay Area based on the MTC data are presented in **Table 29**. Home based trips in Antioch and Contra Costa County are slightly higher than the Bay Area average.

**Table 28: Existing Average Trip Lengths**

Land Use Type	Antioch	Contra Costa County	Bay Area
Home Based VMT	17.9	18.0	15.3

Source: MTC, Fehr & Peers, 2019.

## Analysis Methods

To conduct the VMT assessment, Fehr & Peers used the CCTA travel demand model as well as information from the Metropolitan Transportation Commission (MTC). The CCTA model was used to estimate average trip lengths for the proposed project, while MTC data<sup>13</sup> was used to establish average trip lengths for existing residential uses in Antioch. The existing average trip lengths for the City of Antioch, Contra Costa

<sup>12</sup> <http://analytics.mtc.ca.gov/foswiki/Main/PlanBayAreaVmtPerCapita>

<sup>13</sup> <http://analytics.mtc.ca.gov/foswiki/Main/PlanBayAreaVmtPerCapita>

County and the Bay Area based on the MTC data are presented in **Table 29**. Home based trips in Antioch and Contra Costa County are slightly higher than the Bay Area average, while work based trips to jobs in Antioch are much lower than regional averages, indicating a jobs-housing imbalance where more people commute from Antioch to other employment centers, while jobs in Antioch tend to be filled by more local residents.

**Table 29: Average Home-Based VMT Per Capita**

Land Use Type	Antioch	Contra Costa County	Bay Area
Home Based VMT - 2015	17.9	18.0	15.3

Source: MTC, Fehr & Peers, 2019.

## Analysis Results

A select zone analysis was conducted using the CCTA model whereby all the trips generated by the residential portion of the project were tracked through the transportation system. Based on this analysis, the proposed project is estimated to generate approximately **22 vehicle miles of travel** per day per person. This includes all trips generated by each person that is projected to live in the development that either start or end at home. This level of vehicle travel is higher than the City of Antioch average as well as the Bay Area Average.

A VMT assessment was not prepared for the proposed commercial uses as the actual uses are unknown. Up to 50,000 square feet of retail uses may be considered to have a less-than-significant VMT impact as it is expected to be locally serving. Office or other employment uses are also expected to have a lower than average trip length.

## VMT Conclusions

Results of the VMT analysis indicate that the project would contribute to an increase in vehicle miles of travel on a per-capita basis as the project adds a housing development that would require residents to travel longer-than-average distances to meet their daily needs. As there are no thresholds of significance, this analysis is being prepared for informational purposes only.

# Appendix

# Appendix A: Traffic Counts

# ALL TRAFFIC DATA

(916) 771-8700

[orders@atdtraffic.com](mailto:orders@atdtraffic.com)

File Name : 17-07654-001

Date : 08/24/2017

## Unshifted Count = All Vehicles & Uturns

	Lone Tree Way Southbound					SR 4 WB Ramps Westbound					Lone Tree Way Northbound					SR 4 WB Ramps Eastbound					Total	Uturns Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL		
7:00	0	54	117	0	171	11	0	20	0	31	200	67	0	0	267	0	0	0	0	0	469	0
7:15	0	69	84	0	153	38	0	29	0	67	190	120	0	0	310	0	0	0	0	0	530	0
7:30	0	135	104	0	239	45	0	45	0	90	181	175	0	0	356	0	0	0	0	0	685	0
7:45	0	216	104	0	320	71	1	87	0	159	199	212	0	0	411	0	0	0	0	0	890	0
Total	0	474	409	0	883	165	1	181	0	347	770	574	0	0	1344	0	0	0	0	0	2574	0
8:00	0	185	111	0	296	60	0	99	0	159	162	172	0	0	334	0	0	0	0	0	789	0
8:15	0	89	92	0	181	51	0	46	0	97	222	165	0	0	387	0	0	0	0	0	665	0
8:30	0	89	87	0	176	42	0	57	0	99	184	140	0	0	324	0	0	0	0	0	599	0
8:45	0	83	86	0	169	34	0	47	0	81	160	123	0	0	283	0	0	0	0	0	533	0
Total	0	446	376	0	822	187	0	249	0	436	728	600	0	0	1328	0	0	0	0	0	2586	0
16:00	0	136	86	0	222	33	0	63	0	96	137	169	0	0	306	0	0	0	0	0	624	0
16:15	0	133	104	0	237	36	0	48	0	84	151	168	0	0	319	0	0	0	0	0	640	0
16:30	0	158	91	0	249	30	1	41	0	72	127	170	0	0	297	0	0	0	0	0	618	0
16:45	0	143	81	0	224	41	0	52	0	93	136	200	0	0	336	0	0	0	0	0	653	0
Total	0	570	362	0	932	140	1	204	0	345	551	707	0	0	1258	0	0	0	0	0	2535	0
17:00	0	130	131	0	261	49	0	54	0	103	129	161	0	0	290	0	0	0	0	0	654	0
17:15	0	146	103	0	249	54	1	66	0	121	146	159	0	0	305	0	0	0	0	0	675	0
17:30	0	145	98	0	243	45	0	55	0	100	145	172	0	0	317	0	0	0	0	0	660	0
17:45	0	122	93	0	215	37	0	60	0	97	114	159	0	0	273	0	0	0	0	0	585	0
Total	0	543	425	0	968	185	1	235	0	421	534	651	0	0	1185	0	0	0	0	0	2574	0
Grand Total	0	2033	1572	0	3605	677	3	869	0	1549	2583	2532	0	0	5115	0	0	0	0	0	10269	0
Apprch %	0.0%	56.4%	43.6%	0.0%		43.7%	0.2%	56.1%	0.0%		50.5%	49.5%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%			
Total %	0.0%	19.8%	15.3%	0.0%	35.1%	6.6%	0.0%	8.5%	0.0%	15.1%	25.2%	24.7%	0.0%	0.0%	49.8%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	

AM PEAK HOUR	Lone Tree Way Southbound					SR 4 WB Ramps Westbound					Lone Tree Way Northbound					SR 4 WB Ramps Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	0	135	104	0	239	45	0	45	0	90	181	175	0	0	356	0	0	0	0	0	685
7:45	0	216	104	0	320	71	1	87	0	159	199	212	0	0	411	0	0	0	0	0	890
8:00	0	185	111	0	296	60	0	99	0	159	162	172	0	0	334	0	0	0	0	0	789
8:15	0	89	92	0	181	51	0	46	0	97	222	165	0	0	387	0	0	0	0	0	665
Total Volume	0	625	411	0	1036	227	1	277	0	505	764	724	0	0	1488	0	0	0	0	0	3029
% App Total	0.0%	60.3%	39.7%	0.0%		45.0%	0.2%	54.9%	0.0%		51.3%	48.7%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.000	.723	.926	.000	.809	.799	.250	.699	.000	.794	.860	.854	.000	.000	.905	.000	.000	.000	.000	.000	.851

PM PEAK HOUR	Lone Tree Way Southbound					SR 4 WB Ramps Westbound					Lone Tree Way Northbound					SR 4 WB Ramps Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	0	143	81	0	224	41	0	52	0	93	136	200	0	0	336	0	0	0	0	0	653
17:00	0	130	131	0	261	49	0	54	0	103	129	161	0	0	290	0	0	0	0	0	654
17:15	0	146	103	0	249	54	1	66	0	121	146	159	0	0	305	0	0	0	0	0	675
17:30	0	145	98	0	243	45	0	55	0	100	145	172	0	0	317	0	0	0	0	0	660
Total Volume	0	564	413	0	977	189	1	227	0	417	556	692	0	0	1248	0	0	0	0	0	2642
% App Total	0.0%	57.7%	42.3%	0.0%		45.3%	0.2%	54.4%	0.0%		44.6%	55.4%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.000	.966	.788	.000	.936	.875	.250	.860	.000	.862	.952	.865	.000	.000	.929	.000	.000	.000	.000	.000	.979



# ALL TRAFFIC DATA

(916) 771-8700

[orders@atdtraffic.com](mailto:orders@atdtraffic.com)

File Name : 17-07654-002

Date : 08/24/2017

## Unshifted Count = All Vehicles & Uturns

	Lone Tree Way Southbound					SR 4 EB Ramps Westbound					Lone Tree Way Northbound					SR 4 EB Ramps Eastbound					Total	Uturns Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL		
7:00	33	30	0	0	63	0	0	0	0	0	0	218	24	0	242	47	0	63	0	110	415	0
7:15	25	66	0	0	91	0	0	0	0	0	0	248	35	0	283	61	0	77	0	138	512	0
7:30	62	128	0	0	190	0	0	0	0	0	0	271	42	0	313	78	0	124	0	202	705	0
7:45	94	178	0	2	274	0	0	0	0	0	0	307	47	0	354	101	0	149	0	250	878	2
Total	214	402	0	2	618	0	0	0	0	0	0	1044	148	0	1192	287	0	413	0	700	2510	2
8:00	80	172	0	0	252	0	0	0	0	0	0	252	45	0	297	86	0	108	0	194	743	0
8:15	33	110	0	0	143	0	0	0	0	0	0	296	52	0	348	77	2	120	0	199	690	0
8:30	41	90	0	0	131	0	0	0	0	0	0	242	38	0	280	76	0	137	0	213	624	0
8:45	43	72	0	0	115	0	0	0	0	0	0	238	35	0	273	54	0	105	0	159	547	0
Total	197	444	0	0	641	0	0	0	0	0	0	1028	170	0	1198	293	2	470	0	765	2604	0
16:00	64	98	0	0	162	0	0	0	0	0	0	202	56	0	258	106	0	191	0	297	717	0
16:15	64	103	0	0	167	0	0	0	0	0	0	218	55	0	273	107	0	197	0	304	744	0
16:30	79	113	0	0	192	0	0	0	0	0	0	189	61	0	250	110	0	171	0	281	723	0
16:45	63	117	0	0	180	0	0	0	0	0	0	205	68	0	273	125	0	202	0	327	780	0
Total	270	431	0	0	701	0	0	0	0	0	0	814	240	0	1054	448	0	761	0	1209	2964	0
17:00	58	126	0	0	184	0	0	0	0	0	0	191	66	0	257	104	1	194	0	299	740	0
17:15	66	123	0	0	189	0	0	0	0	0	0	201	60	0	261	104	0	172	0	276	726	0
17:30	80	110	0	0	190	0	0	0	0	0	0	189	47	0	236	112	0	190	0	302	728	0
17:45	55	112	0	1	168	0	0	0	0	0	0	153	54	0	207	110	0	206	0	316	691	1
Total	259	471	0	1	731	0	0	0	0	0	0	734	227	0	961	430	1	762	0	1193	2885	1
Grand Total	940	1748	0	3	2691	0	0	0	0	0	0	3620	785	0	4405	1458	3	2406	0	3867	10963	3
Apprch %	34.9%	65.0%	0.0%	0.1%		0.0%	0.0%	0.0%	0.0%		0.0%	82.2%	17.8%	0.0%		37.7%	0.1%	62.2%	0.0%			
Total %	8.6%	15.9%	0.0%	0.0%	24.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.0%	7.2%	0.0%	40.2%	13.3%	0.0%	21.9%	0.0%	35.3%	100.0%	

AM PEAK HOUR	Lone Tree Way Southbound					SR 4 EB Ramps Westbound					Lone Tree Way Northbound					SR 4 EB Ramps Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	62	128	0	0	190	0	0	0	0	0	0	271	42	0	313	78	0	124	0	202	705
7:45	94	178	0	2	274	0	0	0	0	0	0	307	47	0	354	101	0	149	0	250	878
8:00	80	172	0	0	252	0	0	0	0	0	0	252	45	0	297	86	0	108	0	194	743
8:15	33	110	0	0	143	0	0	0	0	0	0	296	52	0	348	77	2	120	0	199	690
Total Volume	269	588	0	2	859	0	0	0	0	0	0	1126	186	0	1312	342	2	501	0	845	3016
% App Total	31.3%	68.5%	0.0%	0.2%		0.0%	0.0%	0.0%	0.0%		0.0%	85.8%	14.2%	0.0%		40.5%	0.2%	59.3%	0.0%		
PHF	.715	.826	.000	.250	.784	.000	.000	.000	.000	.000	.000	.917	.894	.000	.927	.847	.250	.841	.000	.845	.859

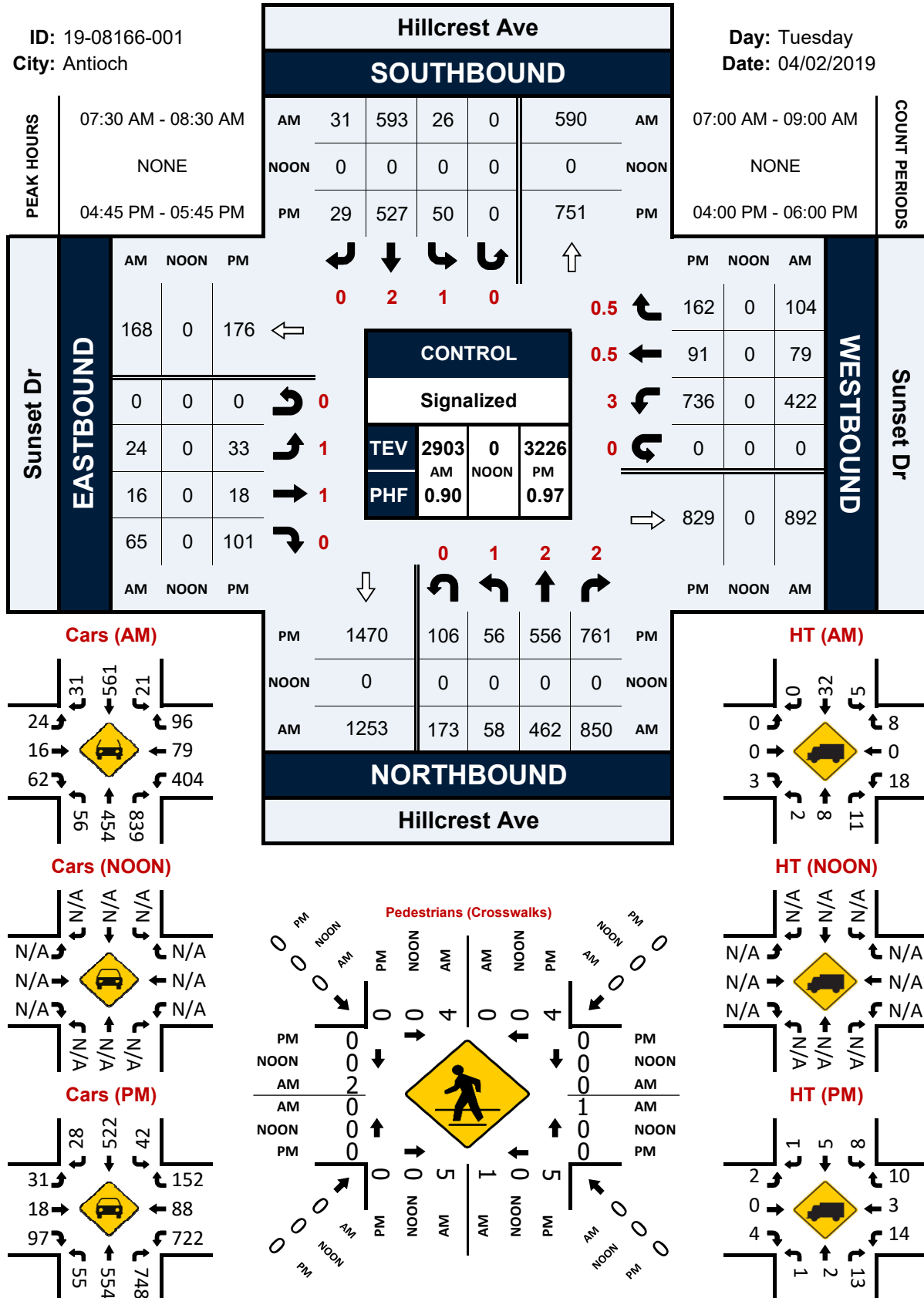
PM PEAK HOUR	Lone Tree Way Southbound					SR 4 EB Ramps Westbound					Lone Tree Way Northbound					SR 4 EB Ramps Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 16:15 to 17:15																					
Peak Hour For Entire Intersection Begins at 16:15																					
16:15	64	103	0	0	167	0	0	0	0	0	0	218	55	0	273	107	0	197	0	304	744
16:30	79	113	0	0	192	0	0	0	0	0	0	189	61	0	250	110	0	171	0	281	723
16:45	63	117	0	0	180	0	0	0	0	0	0	205	68	0	273	125	0	202	0	327	780
17:00	58	126	0	0	184	0	0	0	0	0	0	191	66	0	257	104	1	194	0	299	740
Total Volume	264	459	0	0	723	0	0	0	0	0	0	803	250	0	1053	446	1	764	0	1211	2987
% App Total	36.5%	63.5%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	76.3%	23.7%	0.0%		36.8%	0.1%	63.1%	0.0%		
PHF	.835	.911	.000	.000	.941	.000	.000	.000	.000	.000	.000	.921	.919	.000	.964	.892	.250	.946	.000	.926	.957

# Hillcrest Ave & Sunset Dr

## Peak Hour Turning Movement Count

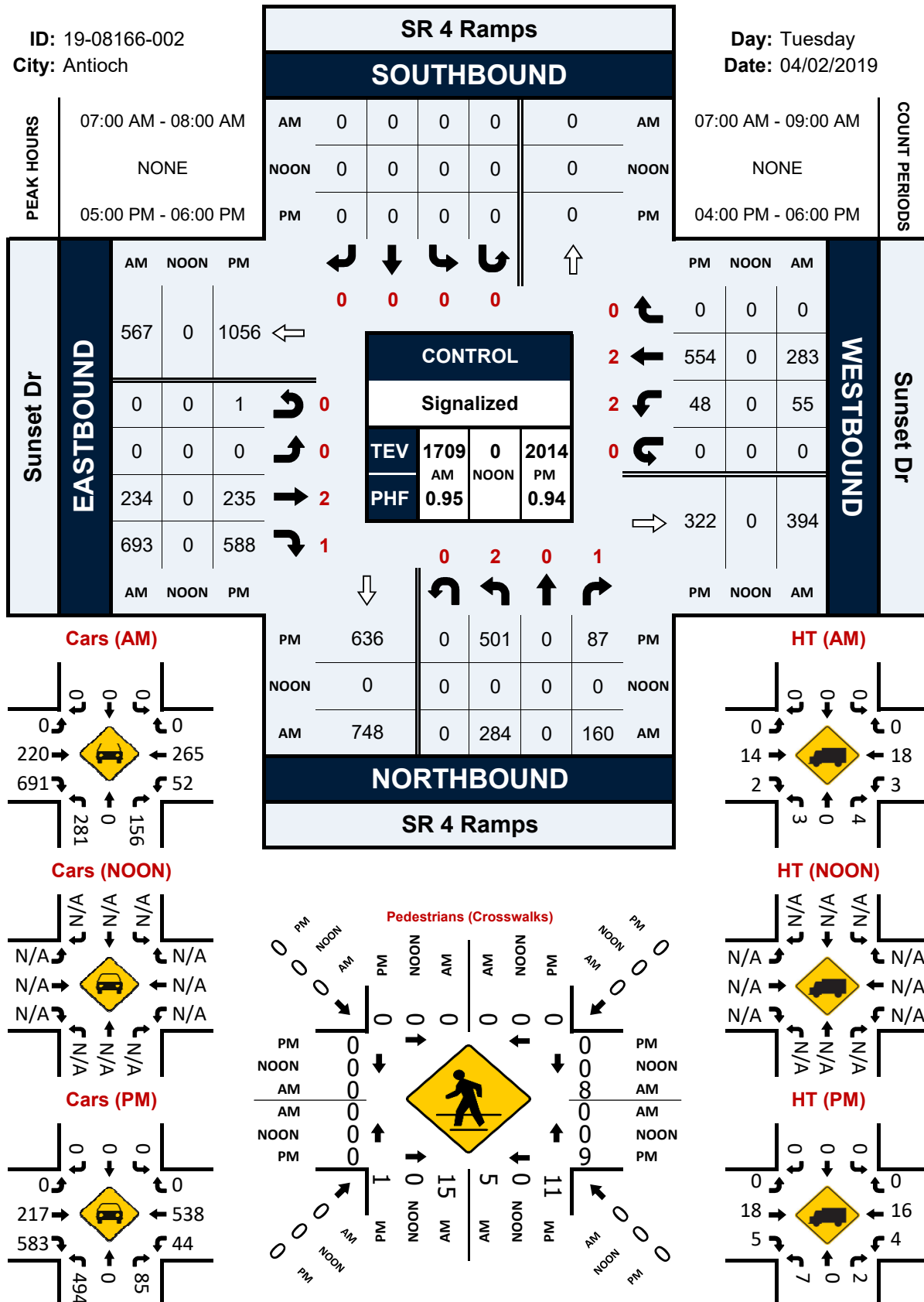
ID: 19-08166-001  
City: Antioch

Day: Tuesday  
Date: 04/02/2019



**ID:** 19-08166-002  
**City:** Antioch

**Day:** Tuesday  
**Date:** 04/02/2019

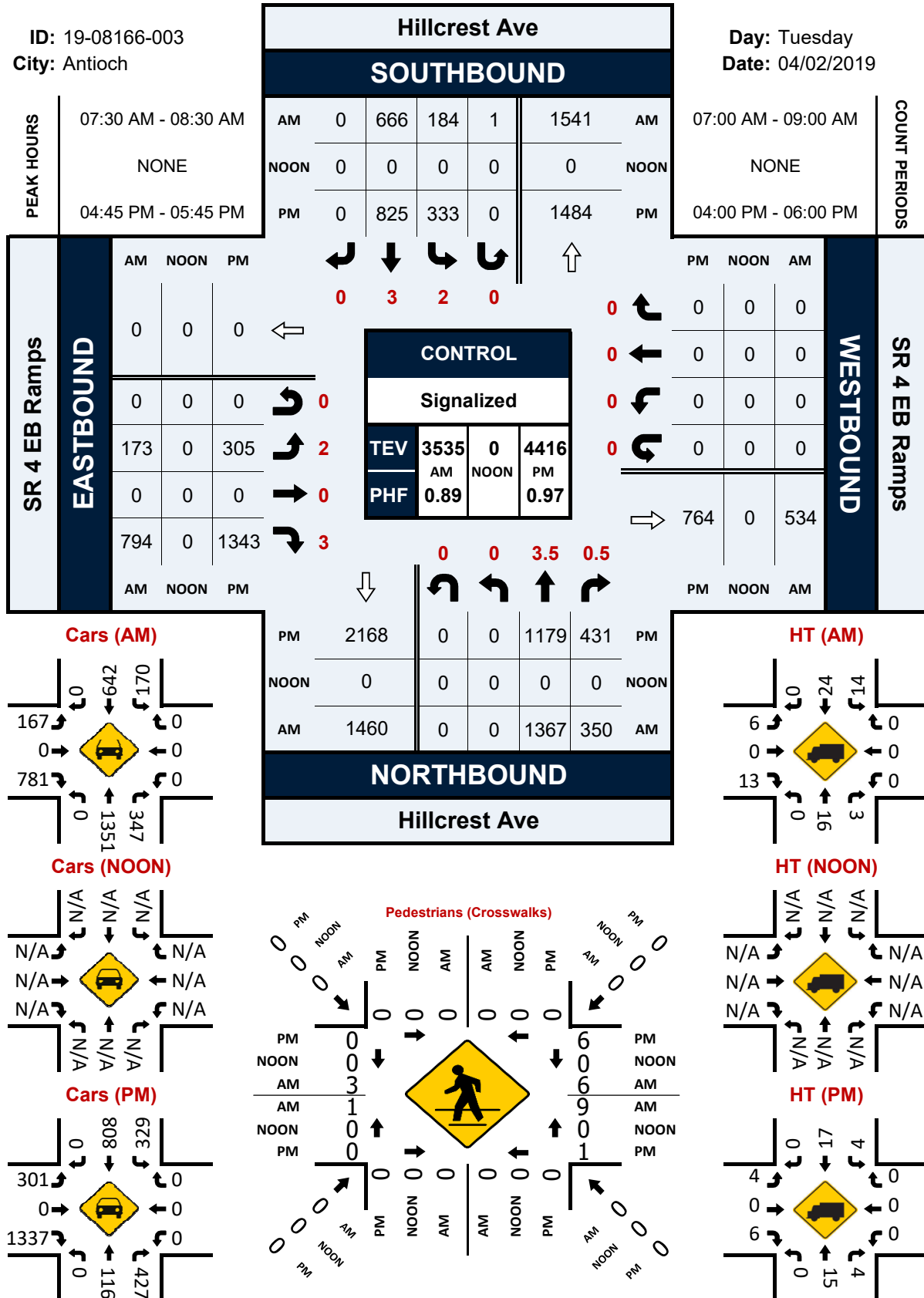


## Hillcrest Ave &amp; SR 4 EB Ramps

## Peak Hour Turning Movement Count

ID: 19-08166-003  
City: Antioch

Day: Tuesday  
Date: 04/02/2019



# ALL TRAFFIC DATA

(916) 771-8700

[orders@atdtraffic.com](mailto:orders@atdtraffic.com)

File Name : 17-07654-005

Date : 08/24/2017

## Unshifted Count = All Vehicles & Uturns

	Lone Tree Way Southbound					Davison Dr Westbound					Lone Tree Way Northbound					Davison Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	17	75	1	1	94	26	3	40	0	69	1	182	12	0	195	5	1	1	0	7	365	1
7:15	15	112	4	0	131	27	4	50	0	81	8	193	15	0	216	3	3	6	0	12	440	0
7:30	24	139	4	1	168	45	6	53	0	104	5	234	28	0	267	10	4	3	0	17	556	1
7:45	40	203	4	1	248	42	8	47	0	97	3	279	26	0	308	5	2	4	0	11	664	1
Total	96	529	13	3	641	140	21	190	0	351	17	888	81	0	986	23	10	14	0	47	2025	3
8:00	35	197	8	1	241	48	9	74	0	131	5	194	24	0	223	1	9	3	0	13	608	1
8:15	52	205	4	2	263	43	8	54	0	105	8	288	31	0	327	10	7	10	0	27	722	2
8:30	25	151	4	0	180	30	8	37	0	75	3	188	14	0	205	4	6	5	0	15	475	0
8:45	38	152	2	3	195	32	9	37	0	78	5	205	17	0	227	6	5	2	0	13	513	3
Total	150	705	18	6	879	153	34	202	0	389	21	875	86	0	982	21	27	20	0	68	2318	6
16:00	45	209	4	0	258	24	10	28	0	62	11	206	24	1	242	15	10	8	0	33	595	1
16:15	46	235	7	4	292	20	9	36	0	65	11	184	25	0	220	9	7	16	0	32	609	4
16:30	38	181	5	3	227	30	7	30	0	67	11	188	24	0	223	9	18	14	0	41	558	3
16:45	35	227	5	2	269	37	9	26	0	72	10	176	31	0	217	13	11	13	0	37	595	2
Total	164	852	21	9	1046	111	35	120	0	266	43	754	104	1	902	46	46	51	0	143	2357	10
17:00	44	221	3	4	272	24	4	35	0	63	13	184	27	0	224	15	14	11	0	40	599	4
17:15	44	221	7	2	274	35	12	19	0	66	20	188	29	0	237	15	6	15	0	36	613	2
17:30	52	203	9	8	272	38	6	41	0	85	11	150	24	1	186	11	14	18	0	43	586	9
17:45	43	220	5	1	269	37	14	35	0	86	11	147	26	0	184	9	5	10	0	24	563	1
Total	183	865	24	15	1087	134	36	130	0	300	55	669	106	1	831	50	39	54	0	143	2361	16
Grand Total	593	2951	76	33	3653	538	126	642	0	1306	136	3186	377	2	3701	140	122	139	0	401	9061	35
Apprch %	16.2%	80.8%	2.1%	0.9%		41.2%	9.6%	49.2%	0.0%		3.7%	86.1%	10.2%	0.1%		34.9%	30.4%	34.7%	0.0%			
Total %	6.5%	32.6%	0.8%	0.4%	40.3%	5.9%	1.4%	7.1%	0.0%	14.4%	1.5%	35.2%	4.2%	0.0%	40.8%	1.5%	1.3%	1.5%	0.0%	4.4%	100.0%	

AM PEAK HOUR	Lone Tree Way Southbound					Davison Dr Westbound					Lone Tree Way Northbound					Davison Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	24	139	4	1	168	45	6	53	0	104	5	234	28	0	267	10	4	3	0	17	556
7:45	40	203	4	1	248	42	8	47	0	97	3	279	26	0	308	5	2	4	0	11	664
8:00	35	197	8	1	241	48	9	74	0	131	5	194	24	0	223	1	9	3	0	13	608
8:15	52	205	4	2	263	43	8	54	0	105	8	288	31	0	327	10	7	10	0	27	722
Total Volume	151	744	20	5	920	178	31	228	0	437	21	995	109	0	1125	26	22	20	0	68	2550
% App Total	16.4%	80.9%	2.2%	0.5%		40.7%	7.1%	52.2%	0.0%		1.9%	88.4%	9.7%	0.0%		38.2%	32.4%	29.4%	0.0%		
PHF	.726	.907	.625	.625	.875	.927	.861	.770	.000	.834	.656	.864	.879	.000	.860	.650	.611	.500	.000	.630	.883

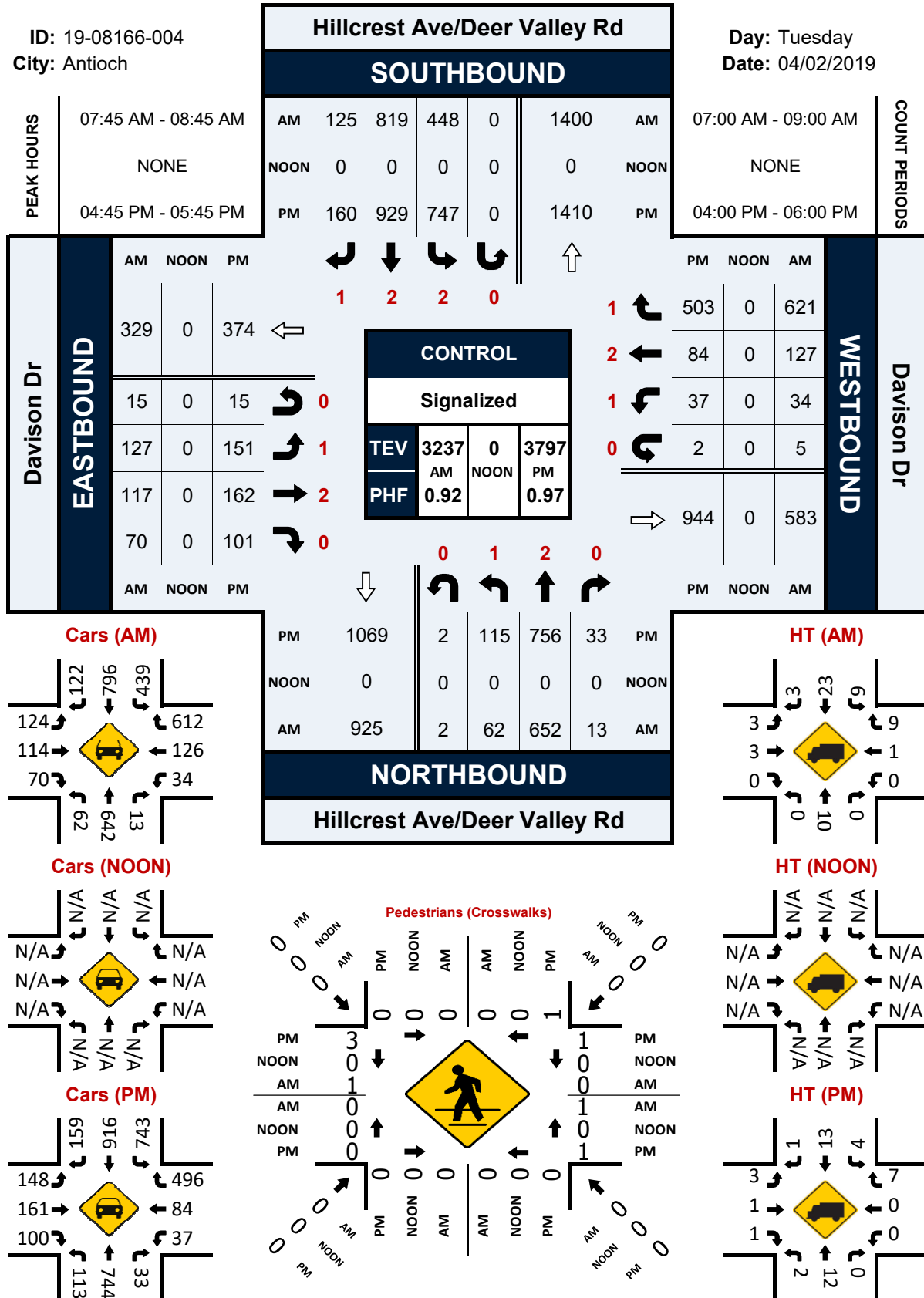
PM PEAK HOUR	Lone Tree Way Southbound					Davison Dr Westbound					Lone Tree Way Northbound					Davison Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	35	227	5	2	269	37	9	26	0	72	10	176	31	0	217	13	11	13	0	37	595
17:00	44	221	3	4	272	24	4	35	0	63	13	184	27	0	224	15	14	11	0	40	599
17:15	44	221	7	2	274	35	12	19	0	66	20	188	29	0	237	15	6	15	0	36	613
17:30	52	203	9	8	272	38	6	41	0	85	11	150	24	1	186	11	14	18	0	43	586
Total Volume	175	872	24	16	1087	134	31	121	0	286	54	698	111	1	864	54	45	57	0	156	2393
% App Total	16.1%	80.2%	2.2%	1.5%		46.9%	10.8%	42.3%	0.0%		6.3%	80.8%	12.8%	0.1%		34.6%	28.8%	36.5%	0.0%		
PHF	.841	.960	.667	.500	.992	.882	.646	.738	.000	.841	.675	.928	.895	.250	.911	.900	.804	.792	.000	.907	.976

# Hillcrest Ave/Deer Valley Rd & Davison Dr

## Peak Hour Turning Movement Count

ID: 19-08166-004  
City: Antioch

Day: Tuesday  
Date: 04/02/2019





# ALL TRAFFIC DATA

(916) 771-8700

[orders@atdtraffic.com](mailto:orders@atdtraffic.com)

File Name : 17-07654-007

Date : 08/24/2017

## Unshifted Count = All Vehicles & Uturns

	Lone Tree Way Southbound					James Donlon Blvd Westbound					Lone Tree Way Northbound					James Donlon Blvd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	1	71	23	0	95	0	11	18	1	30	98	184	2	0	284	13	2	55	0	70	479	1
7:15	4	117	27	1	149	0	15	10	0	25	114	187	1	0	302	24	4	116	0	144	620	1
7:30	13	128	24	0	165	3	29	14	0	46	179	254	1	0	434	43	7	174	0	224	869	0
7:45	20	174	32	0	226	2	22	16	0	40	168	235	3	0	406	45	24	152	0	221	893	0
Total	38	490	106	1	635	5	77	58	1	141	559	860	7	0	1426	125	37	497	0	659	2861	2
8:00	16	192	43	2	253	1	20	14	0	35	188	207	7	0	402	38	19	132	0	189	879	2
8:15	13	191	43	1	248	1	22	10	0	33	182	287	2	0	471	30	8	100	0	138	890	1
8:30	4	134	36	0	174	1	13	10	0	24	129	174	2	0	305	23	4	137	0	164	667	0
8:45	6	142	19	2	169	0	11	5	0	16	149	242	1	0	392	29	1	108	0	138	715	2
Total	39	659	141	5	844	3	66	39	0	108	648	910	12	0	1570	120	32	477	0	629	3151	5
16:00	17	197	33	0	247	4	16	16	1	37	108	210	5	0	323	23	18	129	0	170	777	1
16:15	19	218	34	1	272	4	7	19	0	30	122	156	2	0	280	40	26	154	0	220	802	1
16:30	16	185	32	1	234	3	11	6	1	21	111	175	1	0	287	28	16	152	0	196	738	2
16:45	9	222	37	1	269	1	11	18	0	30	133	149	2	0	284	34	19	183	0	236	819	1
Total	61	822	136	3	1022	12	45	59	2	118	474	690	10	0	1174	125	79	618	0	822	3136	5
17:00	14	219	44	0	277	3	6	13	0	22	101	176	4	0	281	37	13	163	0	213	793	0
17:15	16	229	39	1	285	1	8	12	0	21	105	181	1	0	287	36	22	205	0	263	856	1
17:30	16	218	35	0	269	1	15	10	0	26	123	163	2	0	288	24	21	169	0	214	797	0
17:45	14	196	37	0	247	3	11	9	0	23	110	158	3	0	271	25	24	215	0	264	805	0
Total	60	862	155	1	1078	8	40	44	0	92	439	678	10	0	1127	122	80	752	0	954	3251	1
Grand Total	198	2833	538	10	3579	28	228	200	3	459	2120	3138	39	0	5297	492	228	2344	0	3064	12399	13
Apprch %	5.5%	79.2%	15.0%	0.3%		6.1%	49.7%	43.6%	0.7%		40.0%	59.2%	0.7%	0.0%		16.1%	7.4%	76.5%	0.0%			
Total %	1.6%	22.8%	4.3%	0.1%	28.9%	0.2%	1.8%	1.6%	0.0%	3.7%	17.1%	25.3%	0.3%	0.0%	42.7%	4.0%	1.8%	18.9%	0.0%	24.7%	100.0%	

AM PEAK HOUR	Lone Tree Way Southbound					James Donlon Blvd Westbound					Lone Tree Way Northbound					James Donlon Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	13	128	24	0	165	3	29	14	0	46	179	254	1	0	434	43	7	174	0	224	869
7:45	20	174	32	0	226	2	22	16	0	40	168	235	3	0	406	45	24	152	0	221	893
8:00	16	192	43	2	253	1	20	14	0	35	188	207	7	0	402	38	19	132	0	189	879
8:15	13	191	43	1	248	1	22	10	0	33	182	287	2	0	471	30	8	100	0	138	890
Total Volume	62	685	142	3	892	7	93	54	0	154	717	983	13	0	1713	156	58	558	0	772	3531
% App Total	7.0%	76.8%	15.9%	0.3%		4.5%	60.4%	35.1%	0.0%		41.9%	57.4%	0.8%	0.0%		20.2%	7.5%	72.3%	0.0%		
PHF	.775	.892	.826	.375	.881	.583	.802	.844	.000	.837	.953	.856	.464	.000	.909	.867	.604	.802	.000	.862	.989

PM PEAK HOUR	Lone Tree Way Southbound					James Donlon Blvd Westbound					Lone Tree Way Northbound					James Donlon Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	9	222	37	1	269	1	11	18	0	30	133	149	2	0	284	34	19	183	0	236	819
17:00	14	219	44	0	277	3	6	13	0	22	101	176	4	0	281	37	13	163	0	213	793
17:15	16	229	39	1	285	1	8	12	0	21	105	181	1	0	287	36	22	205	0	263	856
17:30	16	218	35	0	269	1	15	10	0	26	123	163	2	0	288	24	21	169	0	214	797
Total Volume	55	888	155	2	1100	6	40	53	0	99	462	669	9	0	1140	131	75	720	0	926	3265
% App Total	5.0%	80.7%	14.1%	0.2%		6.1%	40.4%	53.5%	0.0%		40.5%	58.7%	0.8%	0.0%		14.1%	8.1%	77.8%	0.0%		
PHF	.859	.969	.881	.500	.965	.500	.667	.736	.000	.825	.868	.924	.563	.000	.990	.885	.852	.878	.000	.880	.954

# ALL TRAFFIC DATA

(916) 771-8700

[orders@atdtraffic.com](mailto:orders@atdtraffic.com)

File Name : 17-07654-008

Date : 08/24/2017

## Unshifted Count = All Vehicles & Uturns

	Dallas Ranch Rd Southbound					Lone Tree Way Westbound					Dallas Ranch Rd Northbound					Lone Tree Way Eastbound					Total	Uturns Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL		
7:00	6	5	24	0	35	6	135	2	0	143	59	6	7	0	72	2	72	17	0	91	341	0
7:15	10	7	23	0	40	12	139	9	0	160	77	7	20	0	104	4	163	34	1	202	506	1
7:30	14	20	24	0	58	31	215	15	0	261	87	16	35	0	138	2	203	35	0	240	697	0
7:45	12	35	26	0	73	56	221	21	0	298	66	43	42	0	151	12	175	44	0	231	753	0
Total	42	67	97	0	206	105	710	47	0	862	289	72	104	0	465	20	613	130	1	764	2297	1
8:00	13	65	24	0	102	64	244	15	1	324	70	46	50	1	167	17	183	69	0	269	862	2
8:15	22	50	35	0	107	28	188	17	1	234	79	31	43	2	155	14	142	39	0	195	691	3
8:30	8	4	16	0	28	21	174	3	1	199	50	7	19	1	77	9	169	46	0	224	528	2
8:45	11	4	22	1	38	17	269	11	0	297	64	3	24	2	93	4	169	31	0	204	632	3
Total	54	123	97	1	275	130	875	46	3	1054	263	87	136	6	492	44	663	185	0	892	2713	10
16:00	6	13	16	0	35	14	186	11	0	211	60	11	16	2	89	13	162	69	0	244	579	2
16:15	15	8	12	0	35	32	155	10	0	197	54	6	16	2	78	23	191	64	1	279	589	3
16:30	5	7	15	0	27	20	176	10	0	206	39	13	20	1	73	18	188	52	0	258	564	1
16:45	4	9	16	0	29	23	164	3	0	190	38	5	15	1	59	23	176	67	0	266	544	1
Total	30	37	59	0	126	89	681	34	0	804	191	35	67	6	299	77	717	252	1	1047	2276	7
17:00	13	7	21	0	41	19	162	5	3	189	52	12	24	4	92	23	205	55	0	283	605	7
17:15	11	10	15	0	36	32	168	12	0	212	43	10	17	6	76	21	251	73	0	345	669	6
17:30	13	8	21	0	42	17	158	11	0	186	45	16	16	0	77	33	232	61	0	326	631	0
17:45	10	5	19	0	34	30	172	10	3	215	45	15	26	0	86	25	229	63	0	317	652	3
Total	47	30	76	0	153	98	660	38	6	802	185	53	83	10	331	102	917	252	0	1271	2557	16
Grand Total	173	257	329	1	760	422	2926	165	9	3522	928	247	390	22	1587	243	2910	819	2	3974	9843	34
Apprch %	22.8%	33.8%	43.3%	0.1%		12.0%	83.1%	4.7%	0.3%		58.5%	15.6%	24.6%	1.4%		6.1%	73.2%	20.6%	0.1%			
Total %	1.8%	2.6%	3.3%	0.0%	7.7%	4.3%	29.7%	1.7%	0.1%	35.8%	9.4%	2.5%	4.0%	0.2%	16.1%	2.5%	29.6%	8.3%	0.0%	40.4%	100.0%	

AM PEAK HOUR	Dallas Ranch Rd Southbound					Lone Tree Way Westbound					Dallas Ranch Rd Northbound					Lone Tree Way Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	14	20	24	0	58	31	215	15	0	261	87	16	35	0	138	2	203	35	0	240	697
7:45	12	35	26	0	73	56	221	21	0	298	66	43	42	0	151	12	175	44	0	231	753
8:00	13	65	24	0	102	64	244	15	1	324	70	46	50	1	167	17	183	69	0	269	862
8:15	22	50	35	0	107	28	188	17	1	234	79	31	43	2	155	14	142	39	0	195	691
Total Volume	61	170	109	0	340	179	868	68	2	1117	302	136	170	3	611	45	703	187	0	935	3003
% App Total	17.9%	50.0%	32.1%	0.0%		16.0%	77.7%	6.1%	0.2%		49.4%	22.3%	27.8%	0.5%		4.8%	75.2%	20.0%	0.0%		
PHF	.693	.654	.779	.000	.794	.699	.889	.810	.500	.862	.868	.739	.850	.375	.915	.662	.866	.678	.000	.869	.871

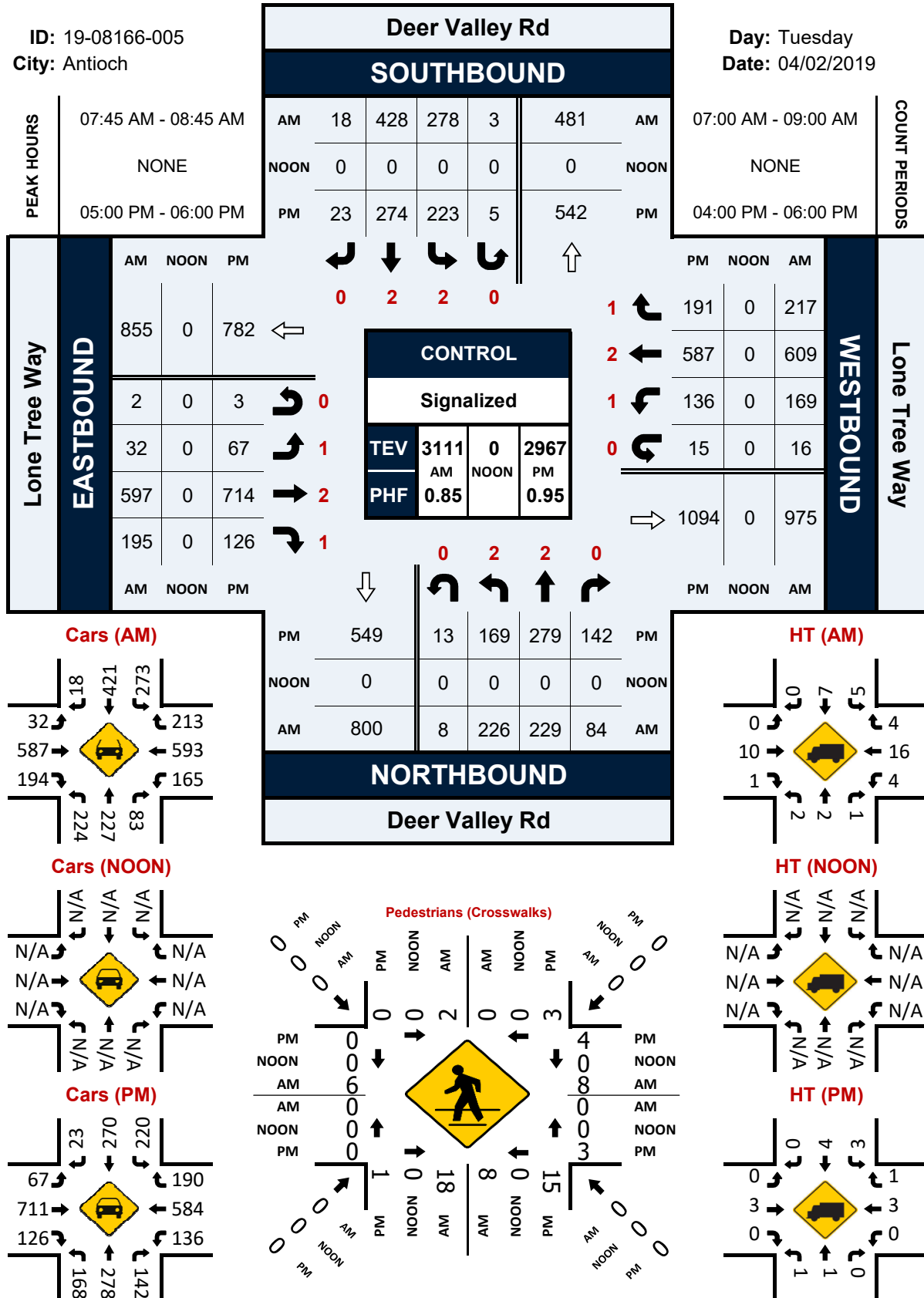
PM PEAK HOUR	Dallas Ranch Rd Southbound					Lone Tree Way Westbound					Dallas Ranch Rd Northbound					Lone Tree Way Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	13	7	21	0	41	19	162	5	3	189	52	12	24	4	92	23	205	55	0	283	605
17:15	11	10	15	0	36	32	168	12	0	212	43	10	17	6	76	21	251	73	0	345	669
17:30	13	8	21	0	42	17	158	11	0	186	45	16	16	0	77	33	232	61	0	326	631
17:45	10	5	19	0	34	30	172	10	3	215	45	15	26	0	86	25	229	63	0	317	652
Total Volume	47	30	76	0	153	98	660	38	6	802	185	53	83	10	331	102	917	252	0	1271	2557
% App Total	30.7%	19.6%	49.7%	0.0%		12.2%	82.3%	4.7%	0.7%		55.9%	16.0%	25.1%	3.0%		8.0%	72.1%	19.8%	0.0%		
PHF	.904	.750	.905	.000	.911	.766	.959	.792	.500	.933	.889	.828	.798	.417	.899	.773	.913	.863	.000	.921	.956

## Deer Valley Rd &amp; Lone Tree Way

## Peak Hour Turning Movement Count

ID: 19-08166-005  
City: Antioch

Day: Tuesday  
Date: 04/02/2019



# ALL TRAFFIC DATA

(916) 771-8700

[orders@atdtraffic.com](mailto:orders@atdtraffic.com)

File Name : 17-07654-010

Date : 08/24/2017

## Unshifted Count = All Vehicles & Uturns

	Hillcrest Ave Southbound					Lone Tree Way Westbound					Hillcrest Ave Northbound					Lone Tree Way Eastbound					Total	Uturns Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL		
7:00	41	6	13	9	69	4	82	15	0	101	5	8	0	0	13	12	52	1	3	68	251	12
7:15	54	16	35	9	114	7	150	23	0	180	7	10	6	0	23	14	89	0	2	105	422	11
7:30	64	19	81	7	171	11	159	36	0	206	6	19	10	0	35	29	138	2	1	170	582	8
7:45	81	17	57	16	171	2	193	34	1	230	11	12	5	0	28	77	155	1	4	237	666	21
Total	240	58	186	41	525	24	584	108	1	717	29	49	21	0	99	132	434	4	10	580	1921	52
8:00	80	12	36	12	140	6	186	35	0	227	11	6	5	0	22	45	129	7	2	183	572	14
8:15	69	20	54	21	164	6	213	43	0	262	4	14	7	0	25	30	74	3	3	110	561	24
8:30	63	12	70	13	158	11	216	35	0	262	7	8	5	0	20	33	103	6	2	144	584	15
8:45	74	14	64	17	169	4	162	44	0	210	5	9	4	0	18	54	133	3	4	194	591	21
Total	286	58	224	63	631	27	777	157	0	961	27	37	21	0	85	162	439	19	11	631	2308	74
16:00	81	8	25	28	142	12	178	50	0	240	6	16	9	0	31	37	195	10	1	243	656	29
16:15	84	14	23	27	148	16	187	44	0	247	8	6	4	0	18	23	167	6	5	201	614	32
16:30	83	12	19	29	143	21	194	40	0	255	6	11	8	0	25	29	213	7	5	254	677	34
16:45	96	12	29	25	162	8	177	58	0	243	6	13	3	1	23	39	206	3	0	248	676	26
Total	344	46	96	109	595	57	736	192	0	985	26	46	24	1	97	128	781	26	11	946	2623	121
17:00	80	21	21	20	142	14	189	46	1	250	6	10	8	0	24	32	190	9	4	235	651	25
17:15	83	18	40	33	174	22	223	77	1	323	7	10	10	0	27	31	179	8	5	223	747	39
17:30	99	25	26	29	179	15	230	57	0	302	4	13	1	0	18	36	199	10	3	248	747	32
17:45	74	18	50	24	166	19	226	43	1	289	10	15	5	0	30	38	180	7	5	230	715	30
Total	336	82	137	106	661	70	868	223	3	1164	27	48	24	0	99	137	748	34	17	936	2860	126
Grand Total	1206	244	643	319	2412	178	2965	680	4	3827	109	180	90	1	380	559	2402	83	49	3093	9712	373
Apprch %	50.0%	10.1%	26.7%	13.2%		4.7%	77.5%	17.8%	0.1%		28.7%	47.4%	23.7%	0.3%		18.1%	77.7%	2.7%	1.6%			
Total %	12.4%	2.5%	6.6%	3.3%	24.8%	1.8%	30.5%	7.0%	0.0%	39.4%	1.1%	1.9%	0.9%	0.0%	3.9%	5.8%	24.7%	0.9%	0.5%	31.8%	100.0%	

AM PEAK HOUR	Hillcrest Ave Southbound					Lone Tree Way Westbound					Hillcrest Ave Northbound					Lone Tree Way Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 07:45 to 08:45																					
Peak Hour For Entire Intersection Begins at 07:45																					
7:45	81	17	57	16	171	2	193	34	1	230	11	12	5	0	28	77	155	1	4	237	666
8:00	80	12	36	12	140	6	186	35	0	227	11	6	5	0	22	45	129	7	2	183	572
8:15	69	20	54	21	164	6	213	43	0	262	4	14	7	0	25	30	74	3	3	110	561
8:30	63	12	70	13	158	11	216	35	0	262	7	8	5	0	20	33	103	6	2	144	584
Total Volume	293	61	217	62	633	25	808	147	1	981	33	40	22	0	95	185	461	17	11	674	2383
% App Total	46.3%	9.6%	34.3%	9.8%		2.5%	82.4%	15.0%	0.1%		34.7%	42.1%	23.2%	0.0%		27.4%	68.4%	2.5%	1.6%		
PHF	.904	.763	.775	.738	.925	.568	.935	.855	.250	.936	.750	.714	.786	.000	.848	.601	.744	.607	.688	.711	.895

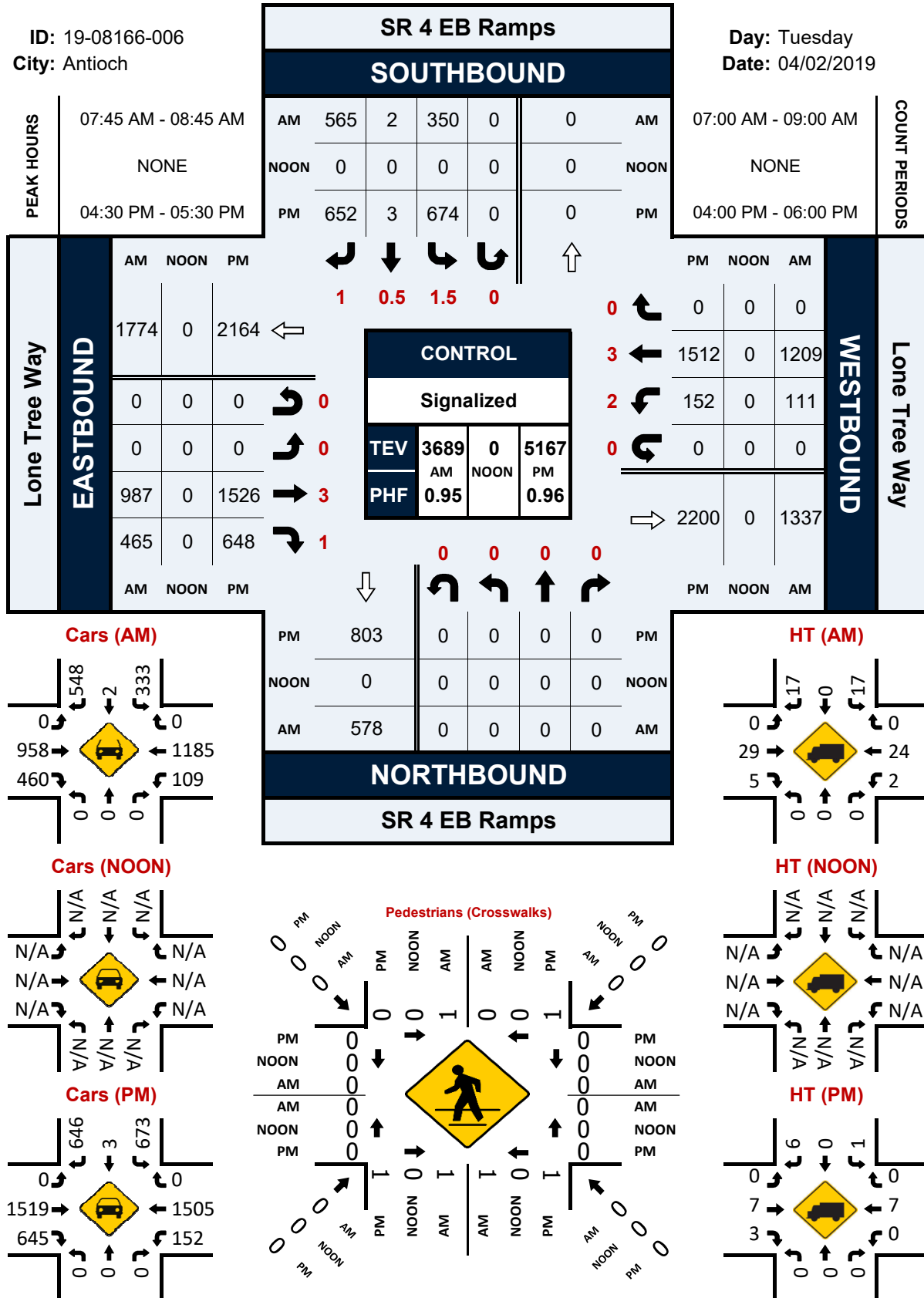
PM PEAK HOUR	Hillcrest Ave Southbound					Lone Tree Way Westbound					Hillcrest Ave Northbound					Lone Tree Way Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	80	21	21	20	142	14	189	46	1	250	6	10	8	0	24	32	190	9	4	235	651
17:15	83	18	40	33	174	22	223	77	1	323	7	10	10	0	27	31	179	8	5	223	747
17:30	99	25	26	29	179	15	230	57	0	302	4	13	1	0	18	36	199	10	3	248	747
17:45	74	18	50	24	166	19	226	43	1	289	10	15	5	0	30	38	180	7	5	230	715
Total Volume	336	82	137	106	661	70	868	223	3	1164	27	48	24	0	99	137	748	34	17	936	2860
% App Total	50.8%	12.4%	20.7%	16.0%		6.0%	74.6%	19.2%	0.3%		27.3%	48.5%	24.2%	0.0%		14.6%	79.9%	3.6%	1.8%		
PHF	.848	.820	.685	.803	.923	.795	.943	.724	.750	.901	.675	.800	.600	.000	.825	.901	.940	.850	.850	.944	.957

## SR 4 EB Ramps &amp; Lone Tree Way

## Peak Hour Turning Movement Count

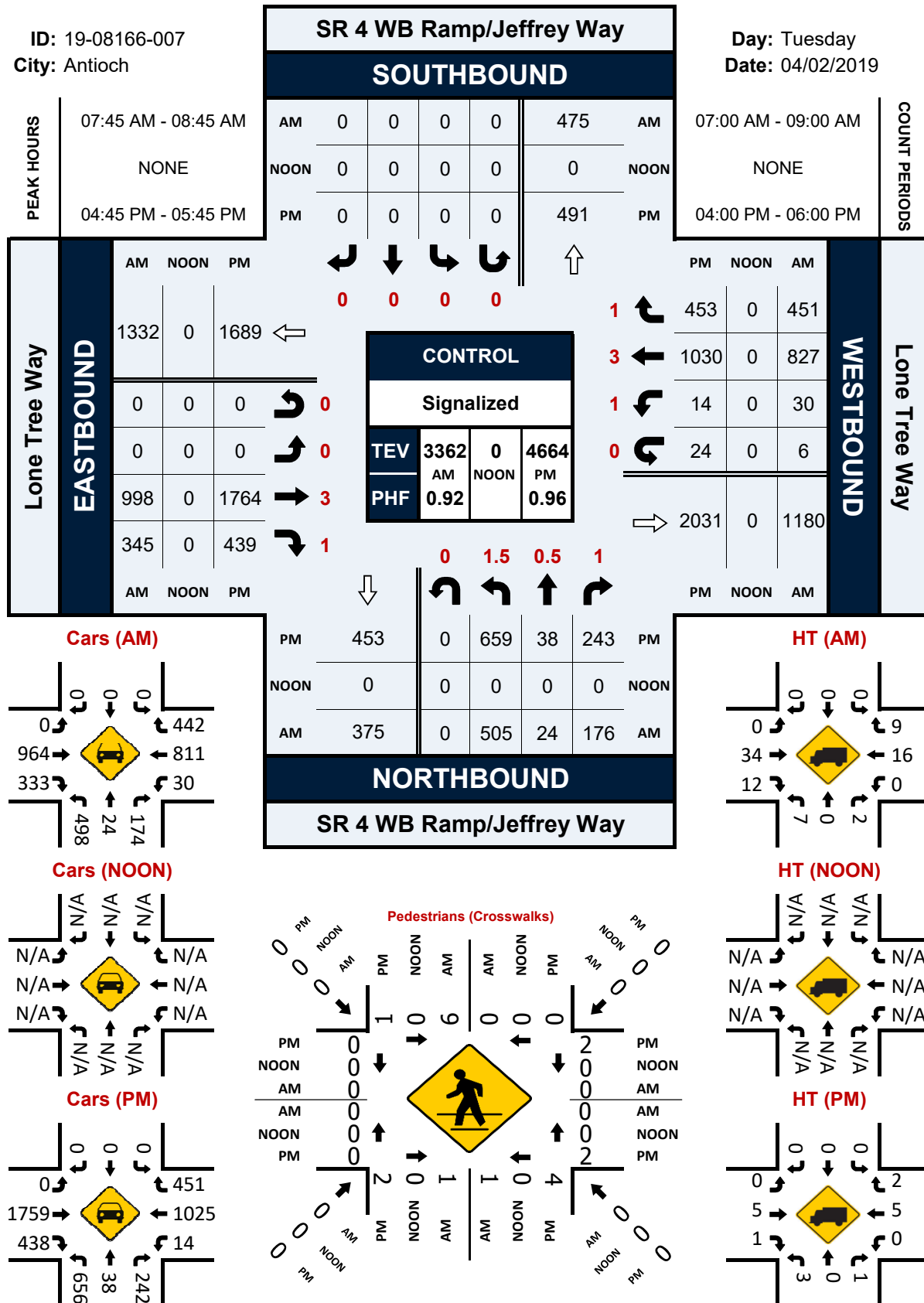
ID: 19-08166-006  
City: Antioch

Day: Tuesday  
Date: 04/02/2019



**ID:** 19-08166-007  
**City:** Antioch

**Day:** Tuesday  
**Date:** 04/02/2019





# ALL TRAFFIC DATA

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File Name : 17-07654-013

Date : 08/24/2017

## Unshifted Count = All Vehicles & Uturns

	Dallas Ranch Rd Southbound					Prewett Ranch Dr Westbound					Dallas Ranch Rd Northbound					Prewett Ranch Dr Eastbound					Total	Uturns Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL		
7:00	22	7	1	0	30	0	3	36	0	39	0	21	2	0	23	2	5	0	0	7	99	0
7:15	31	16	2	0	49	0	4	53	0	57	0	18	2	0	20	6	9	0	0	15	141	0
7:30	51	23	0	0	74	2	6	72	0	80	1	31	4	0	36	9	23	4	0	36	226	0
7:45	68	27	7	0	102	0	21	85	1	107	2	32	4	0	38	10	40	1	0	51	298	1
Total	172	73	10	0	255	2	34	246	1	283	3	102	12	0	117	27	77	5	0	109	764	1
8:00	73	21	10	0	104	5	17	115	0	137	1	38	1	0	40	11	9	0	0	20	301	0
8:15	44	23	5	0	72	0	13	49	0	62	1	27	2	0	30	8	12	0	0	20	184	0
8:30	43	12	4	0	59	1	10	37	0	48	0	18	2	2	22	9	16	2	0	27	156	2
8:45	34	15	6	0	55	3	8	48	0	59	2	19	1	0	22	5	8	1	0	14	150	0
Total	194	71	25	0	290	9	48	249	0	306	4	102	6	2	114	33	45	3	0	81	791	2
16:00	46	18	12	0	76	2	20	28	0	50	0	21	1	0	22	12	6	2	0	20	168	0
16:15	36	20	11	0	67	5	11	31	0	47	2	16	1	0	19	5	12	1	0	18	151	0
16:30	37	25	4	0	66	1	10	31	0	42	0	9	7	0	16	2	11	1	0	14	138	0
16:45	42	28	6	0	76	1	8	40	0	49	1	7	0	1	9	4	8	0	0	12	146	1
Total	161	91	33	0	285	9	49	130	0	188	3	53	9	1	66	23	37	4	0	64	603	1
17:00	45	23	4	0	72	3	7	32	0	42	2	7	3	0	12	6	10	0	0	16	142	0
17:15	48	28	14	0	90	3	14	35	0	52	0	12	1	1	14	4	13	0	0	17	173	1
17:30	43	23	10	0	76	2	13	41	0	56	0	18	2	0	20	13	14	0	0	27	179	0
17:45	46	21	9	0	76	1	12	39	0	52	2	15	3	0	20	10	13	0	0	23	171	0
Total	182	95	37	0	314	9	46	147	0	202	4	52	9	1	66	33	50	0	0	83	665	1
Grand Total	709	330	105	0	1144	29	177	772	1	979	14	309	36	4	363	116	209	12	0	337	2823	5
Apprch %	62.0%	28.8%	9.2%	0.0%		3.0%	18.1%	78.9%	0.1%		3.9%	85.1%	9.9%	1.1%		34.4%	62.0%	3.6%	0.0%			
Total %	25.1%	11.7%	3.7%	0.0%	40.5%	1.0%	6.3%	27.3%	0.0%	34.7%	0.5%	10.9%	1.3%	0.1%	12.9%	4.1%	7.4%	0.4%	0.0%	11.9%	100.0%	

AM PEAK HOUR	Dallas Ranch Rd Southbound					Prewett Ranch Dr Westbound					Dallas Ranch Rd Northbound					Prewett Ranch Dr Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	51	23	0	0	74	2	6	72	0	80	1	31	4	0	36	9	23	4	0	36	226
7:45	68	27	7	0	102	0	21	85	1	107	2	32	4	0	38	10	40	1	0	51	298
8:00	73	21	10	0	104	5	17	115	0	137	1	38	1	0	40	11	9	0	0	20	301
8:15	44	23	5	0	72	0	13	49	0	62	1	27	2	0	30	8	12	0	0	20	184
Total Volume	236	94	22	0	352	7	57	321	1	386	5	128	11	0	144	38	84	5	0	127	1009
% App Total	67.0%	26.7%	6.3%	0.0%		1.8%	14.8%	83.2%	0.3%		3.5%	88.9%	7.6%	0.0%		29.9%	66.1%	3.9%	0.0%		
PHF	.808	.870	.550	.000	.846	.350	.679	.698	.250	.704	.625	.842	.688	.000	.900	.864	.525	.313	.000	.623	.838

PM PEAK HOUR	Dallas Ranch Rd Southbound					Prewett Ranch Dr Westbound					Dallas Ranch Rd Northbound					Prewett Ranch Dr Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	45	23	4	0	72	3	7	32	0	42	2	7	3	0	12	6	10	0	0	16	142
17:15	48	28	14	0	90	3	14	35	0	52	0	12	1	1	14	4	13	0	0	17	173
17:30	43	23	10	0	76	2	13	41	0	56	0	18	2	0	20	13	14	0	0	27	179
17:45	46	21	9	0	76	1	12	39	0	52	2	15	3	0	20	10	13	0	0	23	171
Total Volume	182	95	37	0	314	9	46	147	0	202	4	52	9	1	66	33	50	0	0	83	665
% App Total	58.0%	30.3%	11.8%	0.0%		4.5%	22.8%	72.8%	0.0%		6.1%	78.8%	13.6%	1.5%		39.8%	60.2%	0.0%	0.0%		
PHF	.948	.848	.661	.000	.872	.750	.821	.896	.000	.902	.500	.722	.750	.250	.825	.635	.893	.000	.000	.769	.929

# ALL TRAFFIC DATA

(916) 771-8700

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File Name : 17-07654-014

Date : 08/24/2017

## Unshifted Count = All Vehicles & Uturns

	Deer Valley Rd Southbound					Prewett Ranch Dr Westbound					Deer Valley Rd Northbound					Prewett Ranch Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	4	120	6	1	131	17	12	23	0	52	11	35	3	0	49	12	9	18	0	39	271	1
7:15	13	154	14	1	182	46	12	18	0	76	21	64	14	0	99	13	14	30	0	57	414	1
7:30	9	197	8	8	222	60	26	33	0	119	21	102	36	1	160	45	56	61	0	162	663	9
7:45	18	213	22	5	258	64	58	33	0	155	17	131	37	0	185	29	30	43	0	102	700	5
Total	44	684	50	15	793	187	108	107	0	402	70	332	90	1	493	99	109	152	0	360	2048	16
8:00	23	193	12	4	232	40	60	34	0	134	30	136	31	0	197	27	45	26	0	98	661	4
8:15	13	195	16	2	226	50	15	23	0	88	21	90	12	0	123	15	39	39	0	93	530	2
8:30	19	165	15	5	204	33	14	25	0	72	16	76	21	0	113	36	16	32	0	84	473	5
8:45	8	141	22	15	186	20	19	19	0	58	12	90	24	0	126	54	33	21	0	108	478	15
Total	63	694	65	26	848	143	108	101	0	352	79	392	88	0	559	132	133	118	0	383	2142	26
16:00	10	95	16	2	123	13	15	11	0	39	8	108	16	0	132	6	23	13	0	42	336	2
16:15	18	102	20	2	142	17	20	16	0	53	18	119	33	0	170	14	23	22	0	59	424	2
16:30	16	67	14	0	97	19	26	16	0	61	22	140	28	0	190	7	29	12	0	48	396	0
16:45	23	77	14	3	117	9	19	17	0	45	28	114	28	0	170	15	16	12	0	43	375	3
Total	67	341	64	7	479	58	80	60	0	198	76	481	105	0	662	42	91	59	0	192	1531	7
17:00	24	105	16	1	146	12	22	19	0	53	28	135	43	0	206	13	21	12	0	46	451	1
17:15	15	68	17	1	101	11	27	14	0	52	36	115	47	0	198	18	22	20	0	60	411	1
17:30	35	92	30	0	157	9	16	23	0	48	36	97	28	1	162	15	30	7	0	52	419	1
17:45	27	111	23	2	163	11	23	15	0	49	20	92	17	0	129	18	30	16	0	64	405	2
Total	101	376	86	4	567	43	88	71	0	202	120	439	135	1	695	64	103	55	0	222	1686	5
Grand Total	275	2095	265	52	2687	431	384	339	0	1154	345	1644	418	2	2409	337	436	384	0	1157	7407	54
Apprch %	10.2%	78.0%	9.9%	1.9%		37.3%	33.3%	29.4%	0.0%		14.3%	68.2%	17.4%	0.1%		29.1%	37.7%	33.2%	0.0%			
Total %	3.7%	28.3%	3.6%	0.7%	36.3%	5.8%	5.2%	4.6%	0.0%	15.6%	4.7%	22.2%	5.6%	0.0%	32.5%	4.5%	5.9%	5.2%	0.0%	15.6%	100.0%	

AM PEAK HOUR	Deer Valley Rd Southbound					Prewett Ranch Dr Westbound					Deer Valley Rd Northbound					Prewett Ranch Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	9	197	8	8	222	60	26	33	0	119	21	102	36	1	160	45	56	61	0	162	663
7:45	18	213	22	5	258	64	58	33	0	155	17	131	37	0	185	29	30	43	0	102	700
8:00	23	193	12	4	232	40	60	34	0	134	30	136	31	0	197	27	45	26	0	98	661
8:15	13	195	16	2	226	50	15	23	0	88	21	90	12	0	123	15	39	39	0	93	530
Total Volume	63	798	58	19	938	214	159	123	0	496	89	459	116	1	665	116	170	169	0	455	2554
% App Total	6.7%	85.1%	6.2%	2.0%		43.1%	32.1%	24.8%	0.0%		13.4%	69.0%	17.4%	0.2%		25.5%	37.4%	37.1%	0.0%		
PHF	.685	.937	.659	.594	.909	.836	.663	.904	.000	.800	.742	.844	.784	.250	.844	.644	.759	.693	.000	.702	.912

PM PEAK HOUR	Deer Valley Rd Southbound					Prewett Ranch Dr Westbound					Deer Valley Rd Northbound					Prewett Ranch Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	24	105	16	1	146	12	22	19	0	53	28	135	43	0	206	13	21	12	0	46	451
17:15	15	68	17	1	101	11	27	14	0	52	36	115	47	0	198	18	22	20	0	60	411
17:30	35	92	30	0	157	9	16	23	0	48	36	97	28	1	162	15	30	7	0	52	419
17:45	27	111	23	2	163	11	23	15	0	49	20	92	17	0	129	18	30	16	0	64	405
Total Volume	101	376	86	4	567	43	88	71	0	202	120	439	135	1	695	64	103	55	0	222	1686
% App Total	17.8%	66.3%	15.2%	0.7%		21.3%	43.6%	35.1%	0.0%		17.3%	63.2%	19.4%	0.1%		28.8%	46.4%	24.8%	0.0%		
PHF	.721	.847	.717	.500	.870	.896	.815	.772	.000	.953	.833	.813	.718	.250	.843	.889	.858	.688	.000	.867	.935

# ALL TRAFFIC DATA

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File Name : 17-07654-015

Date : 08/24/2017

## Unshifted Count = All Vehicles & Uturns

	Deer Valley Rd Southbound					Wellness Way Westbound					Deer Valley Rd Northbound					Wellness Way Eastbound					Total	Uturns Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL		
7:00	35	110	0	0	145	0	0	4	0	4	0	40	4	0	44	0	0	0	0	0	193	0
7:15	31	216	0	0	247	0	0	10	0	10	0	77	3	0	80	0	0	0	0	0	337	0
7:30	33	335	0	0	368	0	0	21	0	21	0	170	4	0	174	0	0	0	0	0	563	0
7:45	73	259	0	0	332	1	0	8	0	9	0	196	9	1	206	0	0	0	0	0	547	1
Total	172	920	0	0	1092	1	0	43	0	44	0	483	20	1	504	0	0	0	0	0	1640	1
8:00	89	146	0	1	236	0	0	10	0	10	0	165	6	0	171	0	0	0	0	0	417	1
8:15	98	170	0	0	268	4	0	17	0	21	0	117	19	0	136	0	0	0	0	0	425	0
8:30	89	191	0	0	280	2	0	25	0	27	0	114	11	0	125	0	0	0	0	0	432	0
8:45	77	124	0	0	201	4	0	27	0	31	0	87	4	0	91	0	0	0	0	0	323	0
Total	353	631	0	1	985	10	0	79	0	89	0	483	40	0	523	0	0	0	0	0	1597	1
16:00	29	99	0	0	128	8	0	53	0	61	0	122	1	0	123	0	0	0	0	0	312	0
16:15	30	88	0	0	118	5	0	42	0	47	0	109	5	0	114	0	0	0	0	0	279	0
16:30	11	82	0	0	93	9	0	54	0	63	0	123	1	0	124	0	0	0	0	0	280	0
16:45	17	94	0	0	111	3	0	58	0	61	0	136	1	0	137	0	0	0	0	0	309	0
Total	87	363	0	0	450	25	0	207	0	232	0	490	8	0	498	0	0	0	0	0	1180	0
17:00	11	107	0	0	118	13	0	75	0	88	0	159	1	0	160	0	0	0	0	0	366	0
17:15	12	106	0	0	118	4	0	64	0	68	0	110	1	0	111	0	0	0	0	0	297	0
17:30	12	109	0	0	121	8	0	47	0	55	0	116	1	1	118	0	0	0	0	0	294	1
17:45	12	114	0	0	126	3	0	31	0	34	0	93	1	0	94	0	0	0	0	0	254	0
Total	47	436	0	0	483	28	0	217	0	245	0	478	4	1	483	0	0	0	0	0	1211	1
Grand Total	659	2350	0	1	3010	64	0	546	0	610	0	1934	72	2	2008	0	0	0	0	0	5628	3
Apprch %	21.9%	78.1%	0.0%	0.0%		10.5%	0.0%	89.5%	0.0%		0.0%	96.3%	3.6%	0.1%		0.0%	0.0%	0.0%	0.0%			
Total %	11.7%	41.8%	0.0%	0.0%	53.5%	1.1%	0.0%	9.7%	0.0%	10.8%	0.0%	34.4%	1.3%	0.0%	35.7%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	

AM PEAK HOUR	Deer Valley Rd Southbound					Wellness Way Westbound					Deer Valley Rd Northbound					Wellness Way Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	33	335	0	0	368	0	0	21	0	21	0	170	4	0	174	0	0	0	0	0	563
7:45	73	259	0	0	332	1	0	8	0	9	0	196	9	1	206	0	0	0	0	0	547
8:00	89	146	0	1	236	0	0	10	0	10	0	165	6	0	171	0	0	0	0	0	417
8:15	98	170	0	0	268	4	0	17	0	21	0	117	19	0	136	0	0	0	0	0	425
Total Volume	293	910	0	1	1204	5	0	56	0	61	0	648	38	1	687	0	0	0	0	0	1952
% App Total	24.3%	75.6%	0.0%	0.1%		8.2%	0.0%	91.8%	0.0%		0.0%	94.3%	5.5%	0.1%		0.0%	0.0%	0.0%	0.0%		
PHF	.747	.679	.000	.250	.818	.313	.000	.667	.000	.726	.000	.827	.500	.250	.834	.000	.000	.000	.000	.000	.867

PM PEAK HOUR	Deer Valley Rd Southbound					Wellness Way Westbound					Deer Valley Rd Northbound					Wellness Way Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	17	94	0	0	111	3	0	58	0	61	0	136	1	0	137	0	0	0	0	0	309
17:00	11	107	0	0	118	13	0	75	0	88	0	159	1	0	160	0	0	0	0	0	366
17:15	12	106	0	0	118	4	0	64	0	68	0	110	1	0	111	0	0	0	0	0	297
17:30	12	109	0	0	121	8	0	47	0	55	0	116	1	1	118	0	0	0	0	0	294
Total Volume	52	416	0	0	468	28	0	244	0	272	0	521	4	1	526	0	0	0	0	0	1266
% App Total	11.1%	88.9%	0.0%	0.0%		10.3%	0.0%	89.7%	0.0%		0.0%	99.0%	0.8%	0.2%		0.0%	0.0%	0.0%	0.0%		
PHF	.765	.954	.000	.000	.967	.538	.000	.813	.000	.773	.000	.819	1.000	.250	.822	.000	.000	.000	.000	.000	.865

# ALL TRAFFIC DATA

(916) 771-8700

[orders@atdtraffic.com](mailto:orders@atdtraffic.com)

File Name : 17-07654-016

Date : 08/24/2017

## Unshifted Count = All Vehicles & Uturns

	Deer Valley Rd Southbound					Sand Creek Rd Westbound					Deer Valley Rd Northbound					Sand Creek Rd Eastbound					Total	Uturns Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL		
7:00	16	80	0	0	96	4	0	5	0	9	0	37	3	0	40	1	0	0	0	1	146	0
7:15	71	126	0	0	197	11	0	41	0	52	0	53	8	0	61	0	0	0	0	0	310	0
7:30	145	132	1	0	278	9	0	90	0	99	0	79	10	0	89	1	0	0	0	1	467	0
7:45	115	121	0	0	236	7	0	112	0	119	0	108	6	0	114	0	0	0	0	0	469	0
Total	347	459	1	0	807	31	0	248	0	279	0	277	27	0	304	2	0	0	0	2	1392	0
8:00	32	67	0	0	99	4	0	60	0	64	0	93	12	0	105	0	0	0	0	0	268	0
8:15	56	56	1	1	114	8	0	37	0	45	0	110	14	0	124	0	0	0	0	0	283	1
8:30	94	43	0	1	138	5	0	65	0	70	0	76	8	0	84	0	0	0	0	0	292	1
8:45	23	43	0	0	66	5	0	29	0	34	0	55	13	0	68	0	0	0	0	0	168	0
Total	205	209	1	2	417	22	0	191	0	213	0	334	47	0	381	0	0	0	0	0	1011	2
16:00	9	80	0	1	90	23	0	14	0	37	0	79	5	0	84	0	0	0	0	0	211	1
16:15	7	70	0	1	78	10	0	8	0	18	1	67	5	0	73	0	0	0	0	0	169	1
16:30	17	69	0	1	87	22	0	9	0	31	0	66	3	0	69	1	0	0	0	1	188	1
16:45	20	76	0	0	96	15	0	16	0	31	0	66	9	0	75	0	0	0	0	0	202	0
Total	53	295	0	3	351	70	0	47	0	117	1	278	22	0	301	1	0	0	0	1	770	3
17:00	26	103	0	1	130	13	0	23	0	36	1	68	7	0	76	0	0	0	0	0	242	1
17:15	26	81	0	0	107	9	0	11	0	20	0	60	8	0	68	1	0	0	0	1	196	0
17:30	47	68	0	0	115	9	0	12	1	22	0	69	2	0	71	0	0	0	0	0	208	1
17:45	60	41	0	0	101	6	0	9	0	15	0	61	7	0	68	0	0	0	0	0	184	0
Total	159	293	0	1	453	37	0	55	1	93	1	258	24	0	283	1	0	0	0	1	830	2
Grand Total	764	1256	2	6	2028	160	0	541	1	702	2	1147	120	0	1269	4	0	0	0	4	4003	7
Apprch %	37.7%	61.9%	0.1%	0.3%		22.8%	0.0%	77.1%	0.1%		0.2%	90.4%	9.5%	0.0%		100.0%	0.0%	0.0%	0.0%			
Total %	19.1%	31.4%	0.0%	0.1%	50.7%	4.0%	0.0%	13.5%	0.0%	17.5%	0.0%	28.7%	3.0%	0.0%	31.7%	0.1%	0.0%	0.0%	0.0%	0.1%	100.0%	

AM PEAK HOUR	Deer Valley Rd Southbound					Sand Creek Rd Westbound					Deer Valley Rd Northbound					Sand Creek Rd Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	71	126	0	0	197	11	0	41	0	52	0	53	8	0	61	0	0	0	0	0	310
7:30	145	132	1	0	278	9	0	90	0	99	0	79	10	0	89	1	0	0	0	1	467
7:45	115	121	0	0	236	7	0	112	0	119	0	108	6	0	114	0	0	0	0	0	469
8:00	32	67	0	0	99	4	0	60	0	64	0	93	12	0	105	0	0	0	0	0	268
Total Volume	363	446	1	0	810	31	0	303	0	334	0	333	36	0	369	1	0	0	0	1	1514
% App Total	44.8%	55.1%	0.1%	0.0%		9.3%	0.0%	90.7%	0.0%		0.0%	90.2%	9.8%	0.0%		100.0%	0.0%	0.0%	0.0%		
PHF	.626	.845	.250	.000	.728	.705	.000	.676	.000	.702	.000	.771	.750	.000	.809	.250	.000	.000	.000	.250	.807

PM PEAK HOUR	Deer Valley Rd Southbound					Sand Creek Rd Westbound					Deer Valley Rd Northbound					Sand Creek Rd Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	20	76	0	0	96	15	0	16	0	31	0	66	9	0	75	0	0	0	0	0	202
17:00	26	103	0	1	130	13	0	23	0	36	1	68	7	0	76	0	0	0	0	0	242
17:15	26	81	0	0	107	9	0	11	0	20	0	60	8	0	68	1	0	0	0	1	196
17:30	47	68	0	0	115	9	0	12	1	22	0	69	2	0	71	0	0	0	0	0	208
Total Volume	119	328	0	1	448	46	0	62	1	109	1	263	26	0	290	1	0	0	0	1	848
% App Total	26.6%	73.2%	0.0%	0.2%		42.2%	0.0%	56.9%	0.9%		0.3%	90.7%	9.0%	0.0%		100.0%	0.0%	0.0%	0.0%		
PHF	.633	.796	.000	.250	.862	.767	.000	.674	.250	.757	.250	.953	.722	.000	.954	.250	.000	.000	.000	.250	.876

# National Data & Surveying ServicesIntersection Turning Movement Count

**Location:** SR 4 EB Ramps & Sand Creek Rd  
**City:** Brentwood  
**Control:** Signalized

**Project ID:** 19-08008-014  
**Date:** 1/24/2019

## Total

NS/EW Streets:	SR 4 EB Ramps				SR 4 EB Ramps				Sand Creek Rd				Sand Creek Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	0 NT	0 NR	0 NU	2 SL	0 ST	0 SR	0 SU	0 EL	1 ET	0 ER	0 EU	0 WL	2 WT	0 WR	0 WU	
6:00 AM	0	0	0	0	25	0	0	0	0	0	0	0	0	0	25	0	50
6:15 AM	0	0	0	0	35	0	1	0	0	0	0	0	0	0	22	0	58
6:30 AM	0	0	0	0	61	0	0	0	0	0	0	0	0	0	36	0	97
6:45 AM	0	0	0	0	89	0	0	0	0	0	0	0	0	0	34	1	124
7:00 AM	0	0	0	0	101	0	0	0	1	0	0	0	0	0	61	0	163
7:15 AM	0	0	0	0	136	0	1	0	0	1	0	0	0	0	99	0	237
7:30 AM	0	0	0	0	170	0	0	0	0	0	0	0	0	0	78	1	249
7:45 AM	0	0	0	0	258	0	0	0	0	0	0	0	0	0	84	0	342
8:00 AM	0	0	0	0	188	0	0	0	0	0	0	0	0	0	52	0	240
8:15 AM	0	0	0	0	174	0	0	0	0	0	0	0	0	0	47	0	221
8:30 AM	0	0	0	0	168	0	0	0	0	0	0	0	0	0	44	0	212
8:45 AM	0	0	0	0	165	0	0	0	0	0	0	0	0	0	43	0	208
<b>TOTAL VOLUMES :</b>	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	<b>TOTAL</b>
<b>APPROACH %'s :</b>	0	0	0	0	1570	0	2	0	1	1	0	0	0	0	625	2	2201
					99.87%	0.00%	0.13%	0.00%	50.00%	50.00%	0.00%	0.00%	0.00%	0.00%	99.68%	0.32%	
<b>PEAK HR :</b>	07:15 AM - 08:15 AM				752	0	1	0	0	1	0	0	0	0	313	1	<b>TOTAL</b>
<b>PEAK HR VOL :</b>	0	0	0	0	0.729	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.790	0.250	1068
<b>PEAK HR FACTOR :</b>	0.000	0.000	0.000	0.000			0.730			0.250					0.793		0.781

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	0 NT	0 NR	0 NU	2 SL	0 ST	0 SR	0 SU	0 EL	1 ET	0 ER	0 EU	0 WL	2 WT	0 WR	0 WU	
3:00 PM	0	0	0	0	272	0	0	0	0	0	0	0	0	0	53	1	326
3:15 PM	0	0	0	0	273	0	0	0	0	0	0	0	0	0	35	0	308
3:30 PM	0	0	0	0	306	0	0	0	0	0	0	0	0	0	29	0	335
3:45 PM	0	0	0	0	262	0	0	0	0	0	0	0	0	0	39	0	301
4:00 PM	0	0	0	0	300	0	0	0	0	0	0	0	0	0	39	1	340
4:15 PM	0	0	0	0	279	0	0	0	0	0	0	0	0	0	27	0	306
4:30 PM	0	0	0	0	310	0	0	0	0	0	0	0	0	0	28	2	340
4:45 PM	0	0	0	0	301	0	0	0	0	0	0	0	0	0	25	2	328
5:00 PM	0	0	0	0	322	0	0	0	0	0	0	0	0	0	42	0	364
5:15 PM	0	0	0	0	335	0	0	0	0	0	0	0	0	0	30	0	365
5:30 PM	0	0	0	0	329	0	0	0	0	0	0	0	0	0	33	0	362
5:45 PM	0	0	0	0	301	0	0	0	0	0	0	0	0	0	42	0	343
<b>TOTAL VOLUMES :</b>	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	<b>TOTAL</b>
<b>APPROACH %'s :</b>	0	0	0	0	3590	0	0	0	0	0	0	0	0	0	422	6	4018
					100.00%	0.00%	0.00%	0.00%					0.00%	0.00%	98.60%	1.40%	
<b>PEAK HR :</b>	05:00 PM - 06:00 PM				1287	0	0	0	0	0	0	0	0	0	147	0	<b>TOTAL</b>
<b>PEAK HR VOL :</b>	0	0	0	0	0.960	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.875	0.000	1434
<b>PEAK HR FACTOR :</b>	0.000	0.000	0.000	0.000			0.960								0.875		0.982

# National Data & Surveying ServicesIntersection Turning Movement Count

**Location:** SR 4 WB Ramps & Sand Creek Rd  
**City:** Brentwood  
**Control:** Signalized

**Project ID:** 19-08008-015  
**Date:** 1/24/2019

## Total

NS/EW Streets:		SR 4 WB Ramps				SR 4 WB Ramps				Sand Creek Rd				Sand Creek Rd					
AM		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND					
		1.5 NL	0.5 NT	1 NR	0 NU	0 SL	0 ST	0 SR	0 SU	2 EL	3 ET	0 ER	0 EU	0 WL	1.5 WT	1.5 WR	0 WU		
	6:00 AM	0	1	6	0	0	0	0	0	1	22	0	0	0	24	122	0	TOTAL 176	
	6:15 AM	1	0	3	0	0	0	0	0	1	36	0	0	0	23	139	0	203	
	6:30 AM	0	2	9	0	0	0	0	0	0	60	0	0	0	34	163	0	268	
	6:45 AM	2	0	21	0	0	0	0	0	2	86	0	0	0	34	135	0	280	
	7:00 AM	2	0	17	0	0	0	0	0	0	106	0	0	0	59	170	0	354	
	7:15 AM	3	0	22	0	0	0	0	0	0	133	0	0	0	95	208	0	461	
	7:30 AM	6	0	38	0	0	0	0	0	1	171	0	0	0	78	210	0	504	
	7:45 AM	3	1	42	0	0	0	0	0	1	255	0	0	0	76	220	0	598	
8:00 AM	4	0	30	0	0	0	0	0	1	189	0	0	0	51	233	0	508		
8:15 AM	3	2	26	0	0	0	0	0	3	168	0	0	0	42	284	0	528		
8:30 AM	7	1	22	0	0	0	0	0	1	161	0	1	0	36	187	0	416		
8:45 AM	4	1	31	0	0	0	0	0	1	170	0	1	0	37	178	0	423		
TOTAL VOLUMES:		NL 35	NT 8	NR 267	NU 0	SL 0	ST 0	SR 0	SU 0	EL 12	ET 1557	ER 0	EU 2	WL 0	WT 589	WR 2249	WU 0	TOTAL 4719	
APPROACH %'s:		11.29%	2.58%	86.13%	0.00%					0.76%	99.11%	0.00%	0.13%	0.00%	20.75%	79.25%	0.00%		
PEAK HR:																			TOTAL
PEAK HR VOL:		16	3	136	0	0	0	0	0	6	783	0	0	0	247	947	0	2138	
PEAK HR FACTOR:		0.667	0.375	0.810	0.000	0.000	0.000	0.000	0.000	0.500	0.768	0.000	0.000	0.000	0.792	0.834	0.000	0.894	
		0.842								0.771				0.916					

PM		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND					
		1.5 NL	0.5 NT	1 NR	0 NU	0 SL	0 ST	0 SR	0 SU	2 EL	3 ET	0 ER	0 EU	0 WL	1.5 WT	1.5 WR	0 WU		
	3:00 PM	6	0	69	0	0	0	0	0	0	274	0	0	0	49	226	0	624	
	3:15 PM	3	4	60	0	0	0	0	0	3	273	0	0	0	29	249	0	621	
	3:30 PM	0	0	42	0	0	0	0	0	4	300	0	0	0	31	257	0	634	
	3:45 PM	1	3	44	0	0	0	0	0	4	262	0	0	0	37	218	0	569	
	4:00 PM	2	0	32	0	0	0	0	0	3	292	0	1	0	36	223	0	589	
	4:15 PM	1	0	47	0	0	0	0	0	0	282	0	0	0	30	200	0	560	
	4:30 PM	1	1	43	0	0	0	0	0	4	299	0	0	0	31	213	0	592	
	4:45 PM	1	0	54	0	0	0	0	0	3	297	0	0	0	29	194	0	578	
5:00 PM	1	0	56	0	0	0	0	0	3	326	0	0	0	36	245	0	667		
5:15 PM	1	2	50	0	0	0	0	0	3	328	0	0	0	29	209	0	622		
5:30 PM	1	1	46	0	0	0	0	0	1	329	0	0	0	33	222	0	633		
5:45 PM	1	2	44	0	0	0	0	0	3	301	0	0	0	40	226	0	617		
TOTAL VOLUMES:		NL 19	NT 13	NR 587	NU 0	SL 0	ST 0	SR 0	SU 0	EL 31	ET 3563	ER 0	EU 1	WL 0	WT 410	WR 2682	WU 0	TOTAL 7306	
APPROACH %'s:		3.07%	2.10%	94.83%	0.00%					0.86%	99.11%	0.00%	0.03%	0.00%	13.26%	86.74%	0.00%		
PEAK HR:																			TOTAL
PEAK HR VOL:		4	5	196	0	0	0	0	0	10	1284	0	0	0	138	902	0	2539	
PEAK HR FACTOR:		1.000	0.625	0.875	0.000	0.000	0.000	0.000	0.000	0.833	0.976	0.000	0.000	0.000	0.863	0.920	0.000	0.952	
		0.899								0.977				0.925					



# ALL TRAFFIC DATA

(916) 771-8700

[orders@atdtraffic.com](mailto:orders@atdtraffic.com)

File Name : 17-07654-021

Date : 08/24/2017

## Unshifted Count = All Vehicles & Uturns

	Deer Valley Rd Southbound					Balfour Rd Westbound					Deer Valley Rd Northbound					Balfour Rd Eastbound					Total	Uturns Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL		
7:00	55	29	0	0	84	33	0	34	0	67	0	6	13	0	19	0	0	0	0	0	170	0
7:15	113	27	0	0	140	27	0	60	0	87	0	6	10	0	16	0	0	0	0	0	243	0
7:30	117	22	0	0	139	20	0	82	0	102	0	6	13	0	19	0	0	0	0	0	260	0
7:45	104	20	0	0	124	29	0	101	0	130	0	8	7	0	15	0	0	0	0	0	269	0
Total	389	98	0	0	487	109	0	277	0	386	0	26	43	0	69	0	0	0	0	0	942	0
8:00	80	8	0	0	88	29	0	110	0	139	0	4	9	0	13	0	0	0	0	0	240	0
8:15	54	10	0	0	64	21	0	106	0	127	0	5	6	0	11	0	0	0	0	0	202	0
8:30	43	8	0	0	51	15	0	65	0	80	0	6	5	0	11	0	0	0	0	0	142	0
8:45	53	3	0	0	56	10	0	59	0	69	0	2	6	0	8	0	0	0	0	0	133	0
Total	230	29	0	0	259	75	0	340	0	415	0	17	26	0	43	0	0	0	0	0	717	0
16:00	79	5	0	0	84	7	0	60	0	67	0	16	17	0	33	0	0	0	0	0	184	0
16:15	70	4	0	0	74	10	0	76	0	86	0	10	13	0	23	0	0	0	0	0	183	0
16:30	60	5	0	0	65	3	0	60	0	63	0	8	20	0	28	0	0	0	0	0	156	0
16:45	93	5	0	0	98	6	0	68	0	74	0	10	26	0	36	0	0	0	0	0	208	0
Total	302	19	0	0	321	26	0	264	0	290	0	44	76	0	120	0	0	0	0	0	731	0
17:00	90	11	0	0	101	6	0	58	0	64	0	16	19	0	35	0	0	0	0	0	200	0
17:15	60	6	0	0	66	9	0	66	0	75	0	7	18	0	25	0	0	0	0	0	166	0
17:30	79	6	0	0	85	4	0	64	0	68	0	7	24	0	31	0	0	0	0	0	184	0
17:45	53	7	0	0	60	2	0	52	0	54	0	11	30	0	41	0	0	0	0	0	155	0
Total	282	30	0	0	312	21	0	240	0	261	0	41	91	0	132	0	0	0	0	0	705	0
Grand Total	1203	176	0	0	1379	231	0	1121	0	1352	0	128	236	0	364	0	0	0	0	0	3095	0
Apprch %	87.2%	12.8%	0.0%	0.0%		17.1%	0.0%	82.9%	0.0%		0.0%	35.2%	64.8%	0.0%		0.0%	0.0%	0.0%	0.0%			
Total %	38.9%	5.7%	0.0%	0.0%	44.6%	7.5%	0.0%	36.2%	0.0%	43.7%	0.0%	4.1%	7.6%	0.0%	11.8%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	

AM PEAK HOUR	Deer Valley Rd Southbound					Balfour Rd Westbound					Deer Valley Rd Northbound					Balfour Rd Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	113	27	0	0	140	27	0	60	0	87	0	6	10	0	16	0	0	0	0	0	243
7:30	117	22	0	0	139	20	0	82	0	102	0	6	13	0	19	0	0	0	0	0	260
7:45	104	20	0	0	124	29	0	101	0	130	0	8	7	0	15	0	0	0	0	0	269
8:00	80	8	0	0	88	29	0	110	0	139	0	4	9	0	13	0	0	0	0	0	240
Total Volume	414	77	0	0	491	105	0	353	0	458	0	24	39	0	63	0	0	0	0	0	1012
% App Total	84.3%	15.7%	0.0%	0.0%		22.9%	0.0%	77.1%	0.0%		0.0%	38.1%	61.9%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.885	.713	.000	.000	.877	.905	.000	.802	.000	.824	.000	.750	.750	.000	.829	.000	.000	.000	.000	.000	.941

PM PEAK HOUR	Deer Valley Rd Southbound					Balfour Rd Westbound					Deer Valley Rd Northbound					Balfour Rd Eastbound					Total
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	93	5	0	0	98	6	0	68	0	74	0	10	26	0	36	0	0	0	0	0	208
17:00	90	11	0	0	101	6	0	58	0	64	0	16	19	0	35	0	0	0	0	0	200
17:15	60	6	0	0	66	9	0	66	0	75	0	7	18	0	25	0	0	0	0	0	166
17:30	79	6	0	0	85	4	0	64	0	68	0	7	24	0	31	0	0	0	0	0	184
Total Volume	322	28	0	0	350	25	0	256	0	281	0	40	87	0	127	0	0	0	0	0	758
% App Total	92.0%	8.0%	0.0%	0.0%		8.9%	0.0%	91.1%	0.0%		0.0%	31.5%	68.5%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.866	.636	.000	.000	.866	.694	.000	.941	.000	.937	.000	.625	.837	.000	.882	.000	.000	.000	.000	.000	.911

## SR-4 EB Ramps &amp; Balfour Rd

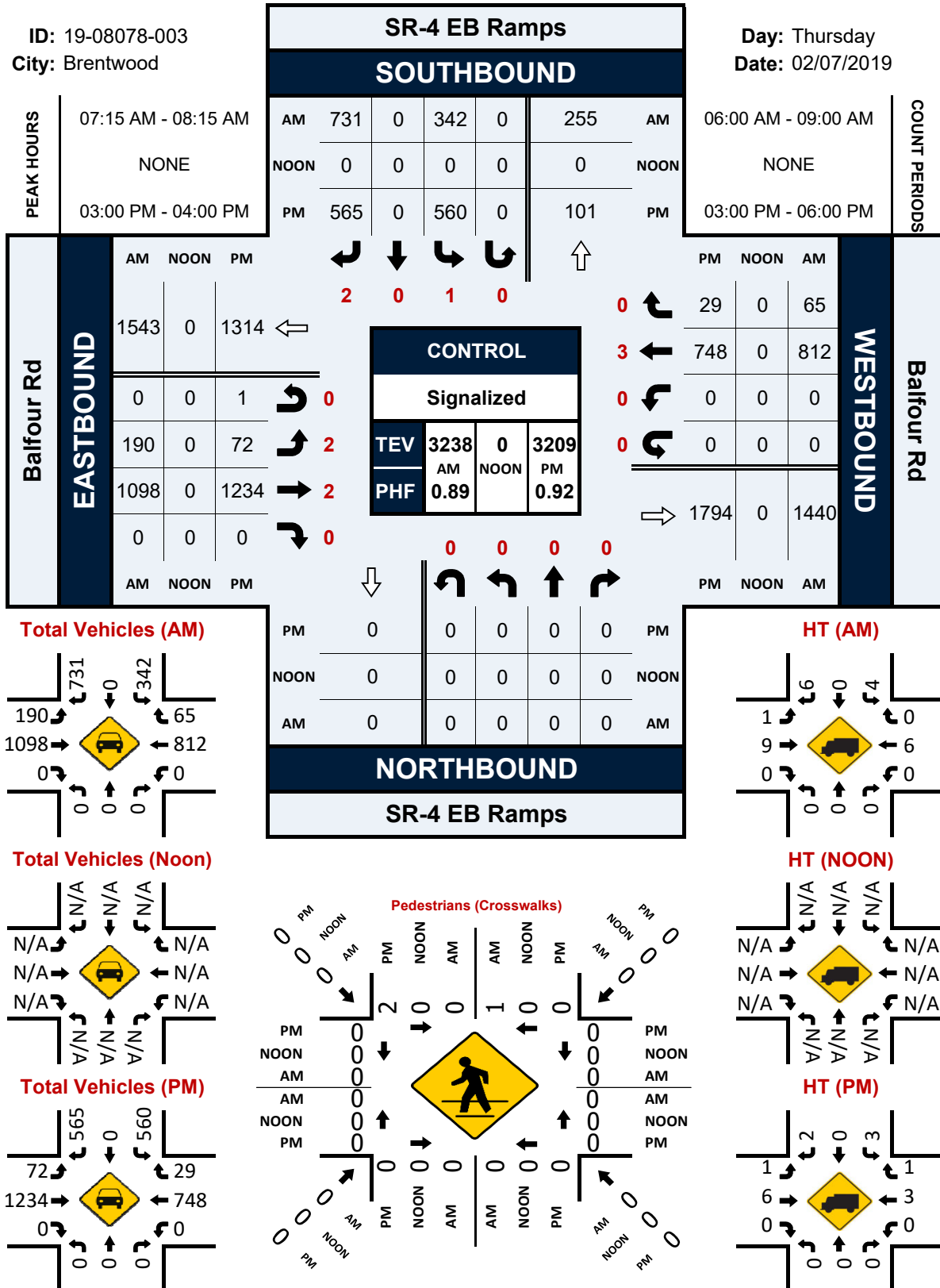
## Peak Hour Turning Movement Count

ID: 19-08078-003

City: Brentwood

Day: Thursday

Date: 02/07/2019



## SR-4 WB Ramps &amp; Balfour Rd

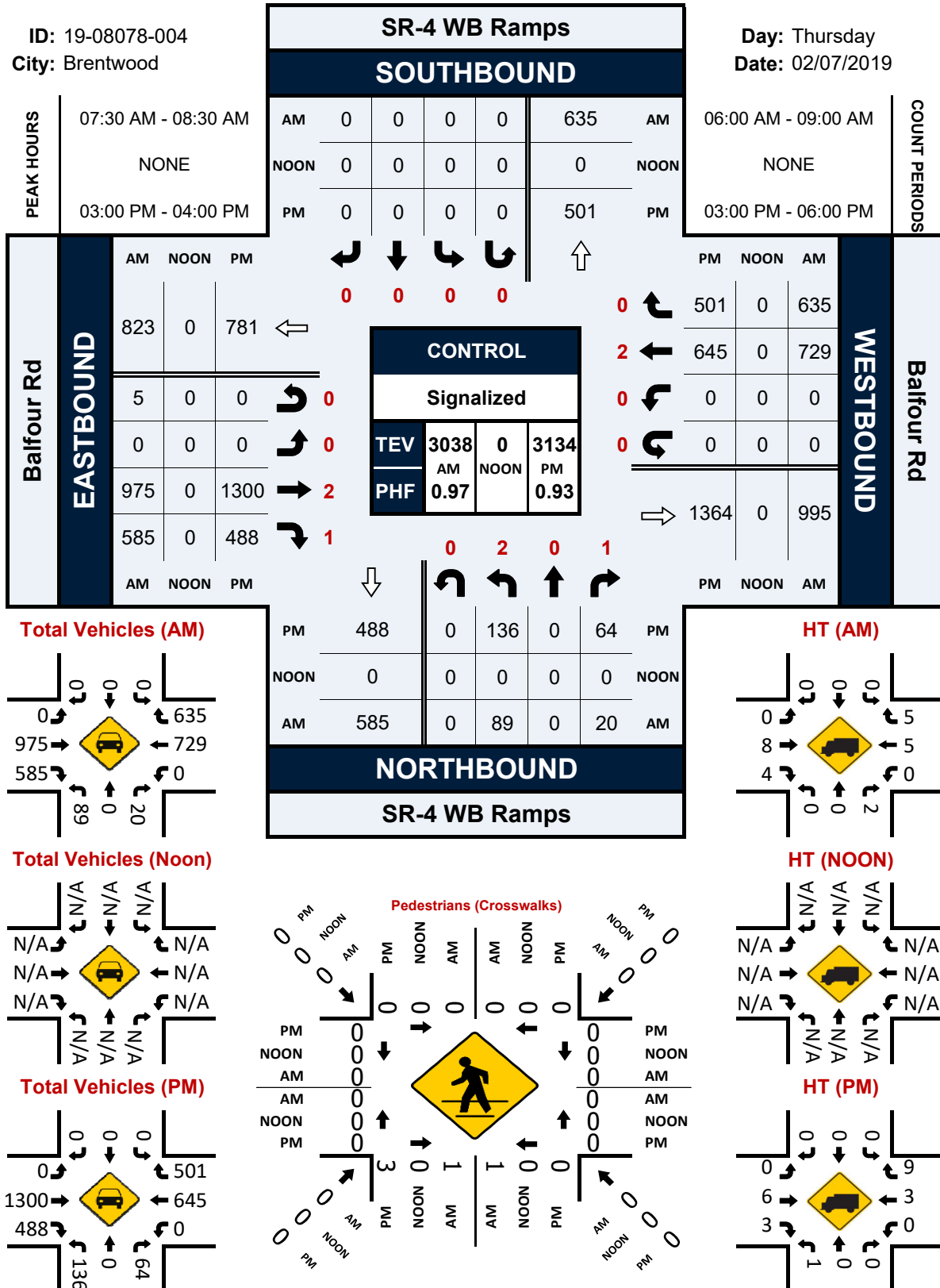
## Peak Hour Turning Movement Count

ID: 19-08078-004

City: Brentwood

Day: Thursday

Date: 02/07/2019





















## Appendix B: HCM LOS Worksheets

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)










The Ranch  
Existing AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	232	0	283	779	739	0	0	645	419
Future Volume (veh/h)	0	0	0	232	0	283	779	739	0	0	645	419
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				273	0	167	916	869	0	0	759	147
Peak Hour Factor				0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %				1	0	1	2	2	0	0	2	2
Cap, veh/h				624	0	286	1116	2329	0	0	1606	393
Arrive On Green				0.18	0.00	0.18	0.32	0.66	0.00	0.00	0.25	0.25
Sat Flow, veh/h				3483	0	1598	3456	3647	0	0	6696	1572
Grp Volume(v), veh/h				273	0	167	916	869	0	0	759	147
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1728	1777	0	0	1609	1572
Q Serve(g_s), s				3.4	0.0	4.6	11.8	5.4	0.0	0.0	4.8	3.7
Cycle Q Clear(g_c), s				3.4	0.0	4.6	11.8	5.4	0.0	0.0	4.8	3.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				624	0	286	1116	2329	0	0	1606	393
V/C Ratio(X)				0.44	0.00	0.58	0.82	0.37	0.00	0.00	0.47	0.37
Avail Cap(c_a), veh/h				3101	0	1422	3220	6548	0	0	5328	1302
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				17.7	0.0	18.2	15.1	3.8	0.0	0.0	15.4	15.0
Incr Delay (d2), s/veh				0.2	0.0	0.7	0.6	0.0	0.0	0.0	0.1	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.1	0.0	1.4	3.5	0.6	0.0	0.0	1.4	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				17.8	0.0	18.9	15.7	3.8	0.0	0.0	15.5	15.2
LnGrp LOS				B	A	B	B	A	A	A	B	B
Approach Vol, veh/h					440			1785			906	
Approach Delay, s/veh					18.2			9.9			15.5	
Approach LOS					B			A			B	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	35.7			19.6			16.1			12.6		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	7.4			13.8			6.8			6.6		
Green Ext Time (p_c), s	3.9			1.8			3.5			0.7		
Intersection Summary												
HCM 6th Ctrl Delay	12.7											
HCM 6th LOS	B											

# HCM 6th Signalized Intersection Summary 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  			 	
Traffic Volume (veh/h)	349	0	511	0	0	0	0	1169	190	276	601	0
Future Volume (veh/h)	349	0	511	0	0	0	0	1169	190	276	601	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1885	1885	1870	1870	0
Adj Flow Rate, veh/h	406	0	594				0	1359	197	321	699	0
Peak Hour Factor	0.86	0.86	0.86				0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3				0	1	1	2	2	0
Cap, veh/h	1000	0	890				0	2192	317	450	1979	0
Arrive On Green	0.28	0.00	0.28				0.00	0.38	0.36	0.13	0.56	0.00
Sat Flow, veh/h	3534	0	3145				0	6028	833	3456	3647	0
Grp Volume(v), veh/h	406	0	594				0	1146	410	321	699	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1621	1734	1728	1777	0
Q Serve(g_s), s	5.4	0.0	9.7				0.0	11.1	11.2	5.2	6.3	0.0
Cycle Q Clear(g_c), s	5.4	0.0	9.7				0.0	11.1	11.2	5.2	6.3	0.0
Prop In Lane	1.00		1.00				0.00		0.48	1.00		0.00
Lane Grp Cap(c), veh/h	1000	0	890				0	1849	659	450	1979	0
V/C Ratio(X)	0.41	0.00	0.67				0.00	0.62	0.62	0.71	0.35	0.00
Avail Cap(c_a), veh/h	4202	0	3739				0	3520	1254	1012	3857	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.9	0.0	18.4				0.0	14.6	14.9	24.2	7.1	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.9				0.0	0.1	0.4	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	3.0				0.0	3.2	3.6	1.9	1.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	0.0	19.3				0.0	14.7	15.2	25.0	7.1	0.0
LnGrp LOS	B	A	B				A	B	B	C	A	A
Approach Vol, veh/h	1000						1556			1020		
Approach Delay, s/veh	18.4						14.9			12.8		
Approach LOS	B						B			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	1.6	26.1	20.4		37.6							
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	7.0	40.7	68.5		* 63							
Max Q Clear Time (g_c+I1),s	17.2	13.2	11.7		8.3							
Green Ext Time (p_c), s	0.4	7.5	4.2		3.0							

## Intersection Summary

HCM 6th Ctrl Delay 15.2  
HCM 6th LOS B

## Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

















# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Existing AM Peak Hour

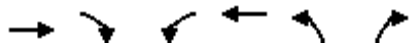


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	 		 	
Traffic Volume (veh/h)	23	2	81	422	79	104	231	462	899	26	593	31
Future Volume (veh/h)	23	2	81	422	79	104	231	462	899	26	593	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1841	1841	1841	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	27	2	0	496	93	66	272	544	376	31	698	31
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	8	8	4	4	4	2	2	2	5	5	5
Cap, veh/h	42	172	0	698	214	152	328	1424	1100	126	977	43
Arrive On Green	0.02	0.10	0.00	0.14	0.21	0.20	0.18	0.40	0.40	0.07	0.29	0.27
Sat Flow, veh/h	1697	1781	0	4944	1002	711	1781	3554	2745	1739	3383	150
Grp Volume(v), veh/h	27	2	0	496	0	159	272	544	376	31	358	371
Grp Sat Flow(s),veh/h/ln	1697	1781	0	1648	0	1713	1781	1777	1372	1739	1735	1799
Q Serve(g_s), s	0.9	0.1	0.0	5.3	0.0	4.5	8.1	6.0	5.3	0.9	10.2	10.2
Cycle Q Clear(g_c), s	0.9	0.1	0.0	5.3	0.0	4.5	8.1	6.0	5.3	0.9	10.2	10.2
Prop In Lane	1.00		0.00	1.00		0.42	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	42	172	0	698	0	365	328	1424	1100	126	501	519
V/C Ratio(X)	0.65	0.01	0.00	0.71	0.00	0.44	0.83	0.38	0.34	0.25	0.71	0.71
Avail Cap(c_a), veh/h	153	956	0	1072	0	1136	547	3101	2395	126	1106	1147
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.8	22.6	0.0	22.7	0.0	19.0	21.7	11.7	11.5	24.3	17.6	17.7
Incr Delay (d2), s/veh	6.1	0.0	0.0	0.5	0.0	0.3	2.1	0.1	0.1	0.4	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.8	0.0	1.5	3.1	1.8	1.2	0.4	3.4	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.9	22.6	0.0	23.2	0.0	19.3	23.8	11.8	11.6	24.6	18.4	18.4
LnGrp LOS	C	C	A	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	29		655			1192			760			
Approach Delay, s/veh	32.2		22.2			14.5			18.6			
Approach LOS	C		C			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	26.2	11.8	9.3	14.2	20.0	5.4	15.8				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	47.4	12.0	29.1	17.0	34.4	5.0	36.1				
Max Q Clear Time (g_c+12, s)	8.0	8.0	7.3	2.1	10.1	12.2	2.9	6.5				
Green Ext Time (p_c), s	0.0	3.1	0.5	0.0	0.2	2.5	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay			17.8									
HCM 6th LOS			B									

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Existing AM Peak Hour







Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	234	693	55	283	322	160
Future Volume (veh/h)	234	693	55	283	322	160
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1366	1366	1856	1856
Adj Flow Rate, veh/h	252	229	59	304	346	34
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	36	36	3	3
Cap, veh/h	1036	456	214	717	613	281
Arrive On Green	0.29	0.29	0.08	0.52	0.18	0.18
Sat Flow, veh/h	3647	1566	2525	1366	3428	1572
Grp Volume(v), veh/h	252	229	59	304	346	34
Grp Sat Flow(s), veh/h/ln	1777	1566	1262	1366	1714	1572
Q Serve(g_s), s	1.5	3.3	0.6	3.7	2.5	0.5
Cycle Q Clear(g_c), s	1.5	3.3	0.6	3.7	2.5	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1036	456	214	717	613	281
V/C Ratio(X)	0.24	0.50	0.28	0.42	0.56	0.12
Avail Cap(c_a), veh/h	7115	3135	524	3222	2339	1073
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.3	7.9	11.6	3.9	10.1	9.3
Incr Delay (d2), s/veh	0.0	0.3	0.7	0.1	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	0.1	0.0	0.7	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.3	8.2	12.3	4.1	10.4	9.4
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	481			363	380	
Approach Delay, s/veh	7.8			5.4	10.3	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		8.8	6.3	11.9		18.1
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		18.4	5.1	53.4		63.0
Max Q Clear Time (g_c+I1), s		4.5	2.6	5.3		5.7
Green Ext Time (p_c), s		0.6	0.0	1.3		1.1
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			7.9			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	0	794	0	0	0	0	1419	350	158	666	0
Future Volume (veh/h)	173	0	794	0	0	0	0	1419	350	158	666	0
Initial Q (Qb), veh	0	0	60				0	60	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	0	1870				0	1870	1870	1826	1826	0
Adj Flow Rate, veh/h	197	0	244				0	1612	361	180	757	0
Peak Hour Factor	0.88	0.88	0.88				0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	0	2				0	2	2	5	5	0
Cap, veh/h	502	0	566				0	2474	470	271	3668	0
Arrive On Green	0.13	0.00	0.13				0.00	0.56	0.54	0.08	0.73	0.00
Sat Flow, veh/h	3456	0	3614				0	4865	922	3374	5149	0
Grp Volume(v), veh/h	197	0	244				0	1318	655	180	757	0
Grp Sat Flow(s),veh/h/ln	1728	0	1205				0	1122	1672	1687	1662	0
Q Serve(g_s), s	3.0	0.0	3.6				0.0	16.3	16.4	2.9	2.8	0.0
Cycle Q Clear(g_c), s	3.0	0.0	3.6				0.0	16.3	16.4	2.9	2.8	0.0
Prop In Lane	1.00		1.00				0.00		0.55	1.00		0.00
Lane Grp Cap(c), veh/h	502	0	566				0	1930	956	271	3668	0
V/C Ratio(X)	0.39	0.00	0.43				0.00	0.68	0.68	0.66	0.21	0.00
Avail Cap(c_a), veh/h	1093	0	1143				0	4024	1998	711	4118	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.1	0.0	36.9				0.0	11.4	10.6	32.9	2.9	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.2				0.0	0.2	0.3	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	141.9				0.0	12.4	5.6	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	11.1				0.0	7.3	7.7	1.5	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	0.0	179.0				0.0	23.9	16.6	33.9	2.9	0.0
LnGrp LOS	C	A	F				A	C	B	C	A	A
Approach Vol, veh/h	441						1973			937		
Approach Delay, s/veh	111.7						21.5			8.9		
Approach LOS	F						C			A		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	9.7	35.6	11.6	45.3								
Change Period (Y+Rc), s	4.9	* 4.9	5.3	4.9								
Max Green Setting (Gmax), s	2.0	* 67	16.7	46.1								
Max Q Clear Time (g_c+I4, s)	14.9	18.4	5.6	4.8								
Green Ext Time (p_c), s	0.2	12.3	0.7	3.4								

### Intersection Summary

HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Contra Loma Plaza/Davison Drive

The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	↰
Traffic Volume (veh/h)	27	22	20	182	32	233	21	1015	111	159	759	20
Future Volume (veh/h)	27	22	20	182	32	233	21	1015	111	159	759	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	25	0	207	36	22	24	1153	121	181	862	23
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	1	1	1	2	2	2	2	2	2
Cap, veh/h	62	50	98	286	300	254	39	1433	150	285	1775	47
Arrive On Green	0.06	0.06	0.00	0.16	0.16	0.16	0.02	0.44	0.43	0.08	0.50	0.49
Sat Flow, veh/h	1000	806	1572	1795	1885	1595	1781	3245	340	3456	3534	94
Grp Volume(v), veh/h	56	0	0	207	36	22	24	630	644	181	433	452
Grp Sat Flow(s),veh/h/ln	1806	0	1572	1795	1885	1595	1781	1777	1808	1728	1777	1851
Q Serve(g_s), s	1.9	0.0	0.0	6.9	1.0	0.7	0.8	19.3	19.5	3.2	10.1	10.1
Cycle Q Clear(g_c), s	1.9	0.0	0.0	6.9	1.0	0.7	0.8	19.3	19.5	3.2	10.1	10.1
Prop In Lane	0.55		1.00	1.00		1.00	1.00		0.19	1.00		0.05
Lane Grp Cap(c), veh/h	113	0	98	286	300	254	39	784	798	285	892	930
V/C Ratio(X)	0.50	0.00	0.00	0.72	0.12	0.09	0.62	0.80	0.81	0.63	0.49	0.49
Avail Cap(c_a), veh/h	1004	0	874	1084	1138	963	453	2117	2154	878	2117	2205
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.6	0.0	0.0	25.1	22.7	22.6	30.5	15.2	15.3	28.0	10.3	10.3
Incr Delay (d2), s/veh	1.3	0.0	0.0	1.3	0.1	0.1	5.8	0.7	0.7	0.9	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	2.7	0.4	0.3	0.4	6.2	6.4	1.3	3.4	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.8	0.0	0.0	26.4	22.7	22.6	36.4	16.0	16.0	28.8	10.5	10.5
LnGrp LOS	C	A	A	C	C	C	D	B	B	C	B	B
Approach Vol, veh/h	56			265			1298			1066		
Approach Delay, s/veh	29.8			25.6			16.4			13.6		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.2	31.8		7.9	5.4	35.6		14.0				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+15), s	15.2	21.5		3.9	2.8	12.1		8.9				
Green Ext Time (p_c), s	0.2	5.7		0.1	0.0	4.1		0.4				

### Intersection Summary











HCM 6th Ctrl Delay	16.5
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	117	70	39	127	621	64	652	13	448	819	125
Future Volume (veh/h)	142	117	70	39	127	621	64	652	13	448	819	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	160	131	18	44	143	698	72	733	14	503	920	68
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	2	2	2
Cap, veh/h	198	1049	141	56	910	1189	156	949	18	609	1199	685
Arrive On Green	0.11	0.33	0.33	0.03	0.25	0.25	0.09	0.26	0.25	0.18	0.34	0.32
Sat Flow, veh/h	1781	3139	423	1795	3582	2812	1795	3594	69	3456	3554	1582
Grp Volume(v), veh/h	160	73	76	44	143	698	72	365	382	503	920	68
Grp Sat Flow(s),veh/h/ln	1781	1777	1786	1795	1791	1406	1795	1791	1872	1728	1777	1582
Q Serve(g_s), s	7.2	2.3	2.4	2.0	2.5	15.6	3.1	15.5	15.5	11.5	19.0	1.1
Cycle Q Clear(g_c), s	7.2	2.3	2.4	2.0	2.5	15.6	3.1	15.5	15.5	11.5	19.0	1.1
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	198	594	596	56	910	1189	156	473	494	609	1199	685
V/C Ratio(X)	0.81	0.12	0.13	0.79	0.16	0.59	0.46	0.77	0.77	0.83	0.77	0.10
Avail Cap(c_a), veh/h	499	1602	1610	219	2661	2564	241	1047	1094	1347	2987	1481
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	19.0	19.1	39.5	23.8	18.2	35.7	27.9	28.0	32.6	24.3	4.9
Incr Delay (d2), s/veh	3.0	0.0	0.0	9.0	0.0	0.2	0.8	1.0	1.0	1.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.9	0.9	1.0	1.0	4.5	1.3	6.2	6.5	4.8	7.6	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	19.0	19.1	48.5	23.8	18.4	36.5	29.0	28.9	33.7	24.7	4.9
LnGrp LOS	D	B	B	D	C	B	D	C	C	C	C	A
Approach Vol, veh/h	309			885			819			1491		
Approach Delay, s/veh	29.2			20.7			29.6			26.8		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	48.5	25.7	6.5	31.4	12.4	31.7	13.1	24.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	32.0	46.7	10.0	73.4	11.0	* 68	23.0	60.4				
Max Q Clear Time (g_c+I1), s	13.5	17.5	4.0	4.4	5.1	21.0	9.2	17.6				
Green Ext Time (p_c), s	0.9	2.6	0.0	0.5	0.0	5.2	0.2	2.1				

### Intersection Summary

HCM 6th Ctrl Delay 26.2

HCM 6th LOS C

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	59	569	7	95	55	731	1003	13	66	699	145
Future Volume (veh/h)	159	59	569	7	95	55	731	1003	13	66	699	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	110	131	82	7	96	8	738	1013	6	67	706	124
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	2	2	2
Cap, veh/h	217	228	386	11	151	135	887	1738	757	85	1165	202
Arrive On Green	0.12	0.12	0.12	0.09	0.09	0.09	0.25	0.49	0.49	0.05	0.27	0.26
Sat Flow, veh/h	1795	1885	3195	127	1737	1551	3483	3582	1561	1781	4362	757
Grp Volume(v), veh/h	110	131	82	103	0	8	738	1013	6	67	549	281
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1864	0	1551	1742	1791	1561	1781	1702	1715
Q Serve(g_s), s	3.5	4.1	1.4	3.3	0.0	0.3	12.4	12.5	0.1	2.3	8.7	8.9
Cycle Q Clear(g_c), s	3.5	4.1	1.4	3.3	0.0	0.3	12.4	12.5	0.1	2.3	8.7	8.9
Prop In Lane	1.00		1.00	0.07		1.00	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	217	228	386	162	0	135	887	1738	757	85	909	458
V/C Ratio(X)	0.51	0.57	0.21	0.64	0.00	0.06	0.83	0.58	0.01	0.79	0.60	0.61
Avail Cap(c_a), veh/h	524	550	932	1178	0	980	1862	3250	1417	317	1875	945
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.4	25.6	24.5	27.2	0.0	25.9	21.8	11.4	8.2	29.1	19.8	20.0
Incr Delay (d2), s/veh	0.7	0.9	0.1	1.5	0.0	0.1	0.8	0.1	0.0	5.8	0.2	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.4	1.7	0.5	1.4	0.0	0.1	4.4	3.7	0.0	1.1	3.2	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	26.1	26.5	24.6	28.8	0.0	25.9	22.6	11.5	8.2	34.9	20.0	20.4
LnGrp LOS	C	C	C	C	A	C	C	B	A	C	C	C
Approach Vol, veh/h	323			111			1757			897		
Approach Delay, s/veh	25.9			28.6			16.1			21.3		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	33.9		11.5	19.7	21.2		9.4				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	1.0	54.7		17.1	33.0	* 33		39.0				
Max Q Clear Time (g_c+14), s	14.5			6.1	14.4	10.9		5.3				
Green Ext Time (p_c), s	0.0	4.8		0.5	1.3	3.8		0.3				

### Intersection Summary

HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱ ↲			↰ ↱ ↲			↰ ↱ ↲			↰ ↱ ↲		
Traffic Volume (veh/h)	46	717	191	185	885	69	311	139	173	62	173	111
Future Volume (veh/h)	46	717	191	185	885	69	311	139	173	62	173	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	53	824	105	213	1017	25	357	160	46	71	199	108
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	68	1130	143	254	1801	44	452	689	570	92	328	178
Arrive On Green	0.04	0.24	0.24	0.14	0.35	0.35	0.13	0.37	0.37	0.05	0.29	0.27
Sat Flow, veh/h	1795	4614	584	1795	5163	127	3483	1885	1560	1810	1142	620
Grp Volume(v), veh/h	53	611	318	213	676	366	357	160	46	71	0	307
Grp Sat Flow(s),veh/h/ln	1795	1716	1768	1795	1716	1859	1742	1885	1560	1810	0	1761
Q Serve(g_s), s	2.4	13.3	13.4	9.4	13.0	13.0	8.1	4.8	1.6	3.2	0.0	12.3
Cycle Q Clear(g_c), s	2.4	13.3	13.4	9.4	13.0	13.0	8.1	4.8	1.6	3.2	0.0	12.3
Prop In Lane	1.00		0.33	1.00		0.07	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	68	840	433	254	1197	648	452	689	570	92	0	505
V/C Ratio(X)	0.78	0.73	0.73	0.84	0.56	0.57	0.79	0.23	0.08	0.77	0.00	0.61
Avail Cap(c_a), veh/h	199	1747	900	530	2380	1290	814	1104	913	245	0	858
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.8	28.2	28.3	34.0	21.5	21.5	34.3	17.9	16.9	38.1	0.0	25.2
Incr Delay (d2), s/veh	7.2	0.5	0.9	2.8	0.2	0.3	1.2	0.1	0.0	5.0	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	5.1	5.3	4.0	4.7	5.1	3.3	1.9	0.5	1.5	0.0	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.9	28.7	29.2	36.8	21.6	21.8	35.5	17.9	16.9	43.1	0.0	25.7
LnGrp LOS	D	C	C	D	C	C	D	B	B	D	A	C
Approach Vol, veh/h	982			1255			563			378		
Approach Delay, s/veh	29.8			24.2			29.0			29.0		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.7	15.5	23.9	14.5	27.3	7.1	32.4					
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	46.3	24.0	* 41	19.0	38.3	9.0	* 56					
Max Q Clear Time (g_c+15, s)	6.8	11.4	15.4	10.1	14.3	4.4	15.0					
Green Ext Time (p_c), s	0.0	0.6	0.2	3.7	0.5	1.0	0.0	4.4				

### Intersection Summary

HCM 6th Ctrl Delay 27.3  
HCM 6th LOS C



























### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Existing AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	27	615	249	211	644	215	307	287	86	297	507	20
Future Volume (veh/h)	27	615	249	211	644	215	307	287	86	297	507	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	31	715	47	245	749	85	357	334	76	345	590	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	43	1352	88	283	1905	215	441	772	173	429	929	33
Arrive On Green	0.02	0.28	0.26	0.16	0.41	0.40	0.13	0.27	0.25	0.12	0.26	0.25
Sat Flow, veh/h	1795	4915	321	1781	4648	524	3483	2892	648	3483	3524	125
Grp Volume(v), veh/h	31	498	264	245	547	287	357	205	205	345	300	311
Grp Sat Flow(s),veh/h/ln	1795	1716	1805	1781	1702	1767	1742	1791	1749	1742	1791	1858
Q Serve(g_s), s	1.6	11.2	11.3	12.2	10.3	10.5	9.1	8.6	8.9	8.8	13.4	13.5
Cycle Q Clear(g_c), s	1.6	11.2	11.3	12.2	10.3	10.5	9.1	8.6	8.9	8.8	13.4	13.5
Prop In Lane	1.00		0.18	1.00		0.30	1.00		0.37	1.00		0.07
Lane Grp Cap(c), veh/h	43	944	497	283	1395	724	441	478	467	429	472	490
V/C Ratio(X)	0.72	0.53	0.53	0.87	0.39	0.40	0.81	0.43	0.44	0.80	0.63	0.64
Avail Cap(c_a), veh/h	118	1434	754	529	2209	1147	728	768	750	766	788	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	27.9	28.1	37.3	18.9	19.1	38.7	27.6	27.9	38.8	29.6	29.7
Incr Delay (d2), s/veh	8.2	0.2	0.3	3.2	0.1	0.1	1.4	0.2	0.2	1.4	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	4.3	4.6	5.3	3.7	3.9	3.8	3.5	3.5	3.6	5.5	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.3	28.1	28.4	40.5	18.9	19.2	40.0	27.8	28.1	40.1	30.1	30.2
LnGrp LOS	D	C	C	D	B	B	D	C	C	D	C	C
Approach Vol, veh/h		793			1079			767			956	
Approach Delay, s/veh		29.2			23.9			33.6			33.8	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.2	28.3	18.4	29.0	15.5	28.0	6.2	41.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+I1), s	10.8	10.9	14.2	13.3	11.1	15.5	3.6	12.5				
Green Ext Time (p_c), s	0.4	1.3	0.3	2.9	0.4	2.0	0.0	3.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				29.7								
HCM 6th LOS				C								

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱ ↲			↰ ↱ ↱ ↱			↰ ↱			↰ ↱ ↱ ↱		
Traffic Volume (veh/h)	154	523	7	30	826	146	36	55	21	310	77	194
Future Volume (veh/h)	154	523	7	30	826	146	36	55	21	310	77	194
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	173	588	2	34	928	42	40	62	3	348	87	218
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	206	2127	7	53	1630	504	61	429	21	466	800	350
Arrive On Green	0.12	0.40	0.38	0.03	0.32	0.32	0.03	0.12	0.10	0.13	0.22	0.22
Sat Flow, veh/h	1781	5253	18	1781	5106	1578	1795	3478	167	3483	3582	1567
Grp Volume(v), veh/h	173	381	209	34	928	42	40	32	33	348	87	218
Grp Sat Flow(s),veh/h/ln	1781	1702	1867	1781	1702	1578	1795	1791	1855	1742	1791	1567
Q Serve(g_s), s	4.9	3.9	3.9	1.0	7.9	1.0	1.1	0.8	0.8	5.0	1.0	6.5
Cycle Q Clear(g_c), s	4.9	3.9	3.9	1.0	7.9	1.0	1.1	0.8	0.8	5.0	1.0	6.5
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	206	1378	756	53	1630	504	61	221	229	466	800	350
V/C Ratio(X)	0.84	0.28	0.28	0.64	0.57	0.08	0.66	0.14	0.15	0.75	0.11	0.62
Avail Cap(c_a), veh/h	206	3035	1665	206	4553	1407	207	1542	1597	470	3153	1380
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.5	10.4	10.4	24.9	14.7	12.4	24.8	20.3	20.4	21.6	16.1	18.2
Incr Delay (d2), s/veh	24.3	0.0	0.1	4.7	0.1	0.0	4.5	0.1	0.1	5.7	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	1.1	1.2	0.4	2.4	0.3	0.5	0.3	0.3	2.1	0.3	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.8	10.4	10.4	29.6	14.8	12.4	29.3	20.4	20.5	27.3	16.1	18.9
LnGrp LOS	D	B	B	C	B	B	C	C	C	C	B	B
Approach Vol, veh/h	763			1004			105			653		
Approach Delay, s/veh	18.7			15.2			23.8			23.0		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.4	5.6	25.0	5.8	15.6	10.0	20.6					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	6.0	45.0	6.0	44.4	6.0	45.0					
Max Q Clear Time (g_c+11), s	2.8	3.0	5.9	3.1	8.5	6.9	9.9					
Green Ext Time (p_c), s	0.0	0.2	0.0	2.2	0.0	0.7	0.0	4.3				

### Intersection Summary

HCM 6th Ctrl Delay	18.6
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	993	465	111	1221	0	0	0	0	350	2	565
Future Volume (veh/h)	0	993	465	111	1221	0	0	0	0	350	2	565
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1079	131	121	1327	0				381	0	584
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	1	1	0				2	2	2
Cap, veh/h	0	1625	504	162	2363	0				1489	0	662
Arrive On Green	0.00	0.32	0.32	0.08	0.46	0.00				0.42	0.00	0.42
Sat Flow, veh/h	0	5316	1596	1975	5316	0				3563	0	1585
Grp Volume(v), veh/h	0	1079	131	121	1327	0				381	0	584
Grp Sat Flow(s),veh/h/ln	0	1716	1596	987	1716	0				1781	0	1585
Q Serve(g_s), s	0.0	11.8	4.0	3.9	12.2	0.0				4.5	0.0	22.1
Cycle Q Clear(g_c), s	0.0	11.8	4.0	3.9	12.2	0.0				4.5	0.0	22.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1625	504	162	2363	0				1489	0	662
V/C Ratio(X)	0.00	0.66	0.26	0.75	0.56	0.00				0.26	0.00	0.88
Avail Cap(c_a), veh/h	0	3637	1128	485	5218	0				3612	0	1607
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.3	16.6	29.2	12.8	0.0				12.4	0.0	17.5
Incr Delay (d2), s/veh	0.0	0.2	0.1	2.6	0.1	0.0				0.0	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.0	1.3	0.9	3.7	0.0				1.5	0.0	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.5	16.7	31.8	12.9	0.0				12.4	0.0	19.0
LnGrp LOS	A	B	B	C	B	A				B	A	B
Approach Vol, veh/h		1210			1448						965	
Approach Delay, s/veh		19.2			14.5						16.4	
Approach LOS		B			B						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	3.0	24.5		31.2		33.9						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	60.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+15), s	15.0	13.8		24.1		14.2						
Green Ext Time (p_c), s	0.1	5.3		1.8		7.0						

### Intersection Summary

HCM 6th Ctrl Delay	16.6
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	998	345	36	827	451	505	24	176	0	0	0
Future Volume (veh/h)	0	998	345	36	827	451	505	24	176	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	0	1085	123	39	899	229	568	0	51			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2			
Cap, veh/h	0	2070	642	63	2765	834	916	0	407			
Arrive On Green	0.00	0.41	0.41	0.04	0.54	0.54	0.26	0.00	0.26			
Sat Flow, veh/h	0	5274	1583	1781	5106	1541	3563	0	1583			
Grp Volume(v), veh/h	0	1085	123	39	899	229	568	0	51			
Grp Sat Flow(s),veh/h/ln	0	1702	1583	1781	1702	1541	1781	0	1583			
Q Serve(g_s), s	0.0	6.4	2.0	0.9	3.9	3.2	5.6	0.0	1.0			
Cycle Q Clear(g_c), s	0.0	6.4	2.0	0.9	3.9	3.2	5.6	0.0	1.0			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2070	642	63	2765	834	916	0	407			
V/C Ratio(X)	0.00	0.52	0.19	0.62	0.33	0.27	0.62	0.00	0.13			
Avail Cap(c_a), veh/h	0	6175	1914	494	8105	2446	4398	0	1954			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	8.9	7.6	18.9	5.1	4.9	13.0	0.0	11.3			
Incr Delay (d2), s/veh	0.0	0.1	0.1	3.7	0.0	0.1	0.3	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	1.4	0.4	0.3	0.6	0.4	1.6	0.0	0.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	9.0	7.7	22.6	5.1	5.0	13.3	0.0	11.4			
LnGrp LOS	A	A	A	C	A	A	B	A	B			
Approach Vol, veh/h		1208			1167			619				
Approach Delay, s/veh		8.9			5.7			13.1				
Approach LOS		A			A			B				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.4	20.1		14.2		25.5						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	1.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+I2), s	1.0	8.4		7.6		5.9						
Green Ext Time (p_c), s	0.0	5.4		1.1		4.6						

## Intersection Summary

HCM 6th Ctrl Delay 8.5  
HCM 6th LOS A

## Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road

The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	86	5	8	58	327	5	131	11	241	96	22
Future Volume (veh/h)	39	86	5	8	58	327	5	131	11	241	96	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.95	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	46	102	4	10	69	212	6	156	6	287	114	9
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	139	451	18	138	99	304	140	560	21	355	938	73
Arrive On Green	0.08	0.25	0.25	0.08	0.25	0.25	0.08	0.16	0.13	0.20	0.28	0.25
Sat Flow, veh/h	1781	1786	70	1767	392	1204	1795	3510	134	1795	3361	262
Grp Volume(v), veh/h	46	0	106	10	0	281	6	79	83	287	60	63
Grp Sat Flow(s),veh/h/ln	1781	0	1856	1767	0	1596	1795	1791	1853	1795	1791	1832
Q Serve(g_s), s	1.3	0.0	2.3	0.3	0.0	8.2	0.2	2.0	2.0	7.8	1.3	1.3
Cycle Q Clear(g_c), s	1.3	0.0	2.3	0.3	0.0	8.2	0.2	2.0	2.0	7.8	1.3	1.3
Prop In Lane	1.00		0.04	1.00		0.75	1.00		0.07	1.00		0.14
Lane Grp Cap(c), veh/h	139	0	469	138	0	403	140	286	296	355	500	511
V/C Ratio(X)	0.33	0.00	0.23	0.07	0.00	0.70	0.04	0.28	0.28	0.81	0.12	0.12
Avail Cap(c_a), veh/h	382	0	1304	379	0	1121	736	1783	1844	736	1783	1824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	0.0	15.2	21.9	0.0	17.4	21.8	18.9	19.0	19.6	13.8	13.9
Incr Delay (d2), s/veh	0.5	0.0	0.1	0.1	0.0	0.8	0.0	0.2	0.2	1.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.8	0.1	0.0	2.5	0.1	0.7	0.7	2.9	0.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	0.0	15.3	22.0	0.0	18.2	21.9	19.1	19.2	21.3	13.8	13.9
LnGrp LOS	C	A	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	152		291			168			410			
Approach Delay, s/veh	17.6		18.3			19.3			19.1			
Approach LOS	B		B			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.1	12.2	8.0	16.9	8.0	18.3	8.0	16.9				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	1.0	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+1.0), s	19.8	4.0	2.3	4.3	2.2	3.3	3.3	10.2				
Green Ext Time (p_c), s	0.3	0.5	0.0	0.3	0.0	0.4	0.0	1.0				

### Intersection Summary

HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B











# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	173	172	218	162	125	92	468	118	84	814	59
Future Volume (veh/h)	118	173	172	218	162	125	92	468	118	84	814	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	130	190	154	240	178	111	101	514	110	92	895	60
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	165	223	181	283	320	200	130	980	209	119	1115	75
Arrive On Green	0.09	0.23	0.23	0.16	0.30	0.30	0.07	0.33	0.32	0.07	0.33	0.31
Sat Flow, veh/h	1795	956	775	1781	1068	666	1795	2935	625	1795	3400	228
Grp Volume(v), veh/h	130	0	344	240	0	289	101	313	311	92	471	484
Grp Sat Flow(s),veh/h/ln	1795	0	1732	1781	0	1734	1795	1791	1769	1795	1791	1837
Q Serve(g_s), s	5.4	0.0	14.6	10.1	0.0	10.8	4.3	10.8	11.0	3.9	18.5	18.5
Cycle Q Clear(g_c), s	5.4	0.0	14.6	10.1	0.0	10.8	4.3	10.8	11.0	3.9	18.5	18.5
Prop In Lane	1.00		0.45	1.00		0.38	1.00		0.35	1.00		0.12
Lane Grp Cap(c), veh/h	165	0	403	283	0	520	130	598	591	119	588	603
V/C Ratio(X)	0.79	0.00	0.85	0.85	0.00	0.56	0.78	0.52	0.53	0.77	0.80	0.80
Avail Cap(c_a), veh/h	350	0	766	463	0	880	210	885	875	280	955	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	0.0	28.2	31.4	0.0	22.6	35.1	20.7	20.9	35.3	23.6	23.6
Incr Delay (d2), s/veh	3.1	0.0	2.0	3.8	0.0	0.3	3.8	0.3	0.3	4.0	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	5.7	4.3	0.0	4.0	1.9	4.1	4.1	1.7	7.1	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.3	0.0	30.2	35.3	0.0	23.0	38.8	20.9	21.2	39.3	24.5	24.6
LnGrp LOS	D	A	C	D	A	C	D	C	C	D	C	C
Approach Vol, veh/h	474		529			725			1047			
Approach Delay, s/veh	32.2		28.5			23.5			25.9			
Approach LOS	C		C			C			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	29.7	16.2	21.9	9.6	29.2	11.1	27.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	2.0	36.7	20.0	34.0	9.0	39.7	15.0	39.0				
Max Q Clear Time (g_c+15, s)	15.0	13.0	12.1	16.6	6.3	20.5	7.4	12.8				
Green Ext Time (p_c), s	0.0	2.1	0.2	1.1	0.0	3.4	0.1	1.0				

### Intersection Summary

HCM 6th Ctrl Delay	26.8
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary 16: Deer Valley Road & Wellness Way

The Ranch  
Existing AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	57	662	39	300	928
Future Volume (veh/h)	5	57	662	39	300	928
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.97	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1885	1885	1885	1885
Adj Flow Rate, veh/h	6	0	761	16	345	1067
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	12	10	1357	589	438	1407
Arrive On Green	0.01	0.00	0.38	0.38	0.24	0.75
Sat Flow, veh/h	1810	1610	3676	1556	1795	1885
Grp Volume(v), veh/h	6	0	761	16	345	1067
Grp Sat Flow(s), veh/h/ln	1810	1610	1791	1556	1795	1885
Q Serve(g_s), s	0.1	0.0	5.4	0.2	5.8	10.7
Cycle Q Clear(g_c), s	0.1	0.0	5.4	0.2	5.8	10.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	12	10	1357	589	438	1407
V/C Ratio(X)	0.51	0.00	0.56	0.03	0.79	0.76
Avail Cap(c_a), veh/h	1900	1691	4536	1970	1830	4541
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	0.0	7.9	6.3	11.5	2.4
Incr Delay (d2), s/veh	12.2	0.0	0.1	0.0	1.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	1.0	0.0	1.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.2	0.0	8.1	6.3	12.7	2.7
LnGrp LOS	C	A	A	A	B	A
Approach Vol, veh/h	6		777			1412
Approach Delay, s/veh	28.2		8.0			5.1
Approach LOS	C		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	1.9	16.3			28.2	4.2
Change Period (Y+Rc), s	4.0	5.3			5.3	4.0
Max Green Setting (Gmax), s	33.0	39.7			76.7	34.0
Max Q Clear Time (g_c+17, s)	17.8	7.4			12.7	2.1
Green Ext Time (p_c), s	0.5	3.3			6.0	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			6.2			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Existing AM Peak Hour











Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Volume (veh/h)	1	0	0	32	0	309	0	340	37	370	455	1
Future Volume (veh/h)	1	0	0	32	0	309	0	340	37	370	455	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	1	0	0	40	0	0	0	420	41	457	562	1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	256	0	0	245	0	65	5	586	57	543	1413	3
Arrive On Green	0.04	0.00	0.00	0.04	0.00	0.00	0.00	0.34	0.31	0.30	0.75	0.72
Sat Flow, veh/h	1683	0	0	1416	0	1598	1810	1700	166	1795	1881	3
Grp Volume(v), veh/h	1	0	0	40	0	0	0	0	461	457	0	563
Grp Sat Flow(s), veh/h/ln	1683	0	0	1416	0	1598	1810	0	1866	1795	0	1885
Q Serve(g_s), s	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	8.3	9.2	0.0	4.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	8.3	9.2	0.0	4.1
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	256	0	0	245	0	65	5	0	643	543	0	1416
V/C Ratio(X)	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.72	0.84	0.00	0.40
Avail Cap(c_a), veh/h	1501	0	0	1471	0	1453	517	0	3491	980	0	4016
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.7	0.0	0.0	18.2	0.0	0.0	0.0	0.0	11.0	12.6	0.0	1.7
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.6	1.4	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	2.2	3.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.7	0.0	0.0	18.3	0.0	0.0	0.0	0.0	11.6	13.9	0.0	1.8
LnGrp LOS	B	A	A	B	A	A	A	A	B	B	A	A
Approach Vol, veh/h	1			40			461			1020		
Approach Delay, s/veh	17.7			18.3			11.6			7.2		
Approach LOS	B			B			B			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.6	17.3		5.6	0.0	32.9		5.6				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	70.7	70.7		35.0	11.0	80.7		35.0				
Max Q Clear Time (g_c+I1), s	10.3	10.3		2.0	0.0	6.1		3.1				
Green Ext Time (p_c), s	0.6	1.7		0.0	0.0	2.6		0.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				8.8								
HCM 6th LOS				A								

# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Existing AM Peak Hour

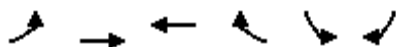







Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	7	0	4	7	0	4	3254	0	4	3254	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3647	0	1781	3647	0	1781	3647	0
Grp Volume(v), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	0	1781	1777	0	1781	1777	0
Q Serve(g_s), 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
Cycle Q Clear(g_c), 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
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	4	7	0	4	7	0	4	3254	0	4	3254	0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	581	3329	0	581	3329	0	581	3254	0	581	3254	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h	0		0				0		0			
Approach Delay, s/veh	0.0		0.0				0.0		0.0			
Approach LOS												
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	0.0	47.5	0.0	0.0	0.0	47.5	0.0	0.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	43.0	43.0	15.0	44.0	15.0	43.0	15.0	44.0				
Max Q Clear Time (g_c+I10), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			0.0									
HCM 6th LOS			A									

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

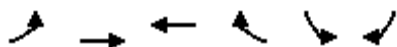
The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	0	0	0	0	0	0	
Future Volume (veh/h)	0	0	0	0	0	0	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	0	0	0	0	0	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	4	8	8	0	1625	1446	
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00	
Sat Flow, veh/h	1781	3647	7294	0	1781	1585	
Grp Volume(v), veh/h	0	0	0	0	0	0	
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	0	1781	1585	
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	
Prop In Lane	1.00			0.00	1.00	1.00	
Lane Grp Cap(c), veh/h	4	8	8	0	1625	1446	
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	
Avail Cap(c_a), veh/h	1224	6205	3453	0	1625	1446	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
LnGrp LOS	A	A	A	A	A	A	
Approach Vol, veh/h		0	0		0		
Approach Delay, s/veh		0.0	0.0		0.0		
Approach LOS							
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				0.0	45.7	0.0	0.0
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				79.3	41.2	30.9	43.9
Max Q Clear Time (g_c+I1), s				0.0	0.0	0.0	0.0
Green Ext Time (p_c), s				0.0	0.0	0.0	0.0
Intersection Summary							
HCM 6th Ctrl Delay			0.0				
HCM 6th LOS			A				

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1	0	314	752	1
Future Volume (veh/h)	0	1	0	314	752	1
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	0	1	0	21	885	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	401	177	177	150	1600	734
Arrive On Green	0.00	0.09	0.00	0.09	0.46	0.00
Sat Flow, veh/h	1391	1870	1870	1585	3483	1598
Grp Volume(v), veh/h	0	1	0	21	885	0
Grp Sat Flow(s), veh/h/ln	1391	1870	1870	1585	1742	1598
Q Serve(g_s), s	0.0	0.0	0.0	0.2	3.3	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.2	3.3	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	401	177	177	150	1600	734
V/C Ratio(X)	0.00	0.01	0.00	0.14	0.55	0.00
Avail Cap(c_a), veh/h	4613	5840	5840	4949	6991	3207
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	7.4	0.0	7.4	3.5	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	7.4	0.0	7.6	3.6	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		1	21		885	
Approach Delay, s/veh		7.4	7.6		3.6	
Approach LOS		A	A		A	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		5.7			5.7	12.2
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		54.7			54.7	34.7
Max Q Clear Time (g_c+I1), s		2.0			2.2	5.3
Green Ext Time (p_c), s		0.0			0.0	1.7
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			3.7			
HCM 6th LOS			A			










# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Existing AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	783	0	0	247	947	16	3	136	0	0	0
Future Volume (veh/h)	6	783	0	0	247	947	16	3	136	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	6	807	0	0	255	507	18	0	13			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	23	2817	0	0	678	1149	319	0	142			
Arrive On Green	0.01	0.55	0.00	0.00	0.36	0.36	0.09	0.00	0.09			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	6	807	0	0	255	507	18	0	13			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	0.0	1.9	0.0	0.0	2.2	2.7	0.1	0.0	0.2			
Cycle Q Clear(g_c), s	0.0	1.9	0.0	0.0	2.2	2.7	0.1	0.0	0.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	23	2817	0	0	678	1149	319	0	142			
V/C Ratio(X)	0.26	0.29	0.00	0.00	0.38	0.44	0.06	0.00	0.09			
Avail Cap(c_a), veh/h	2525	17489	0	0	4698	7962	7526	0	3349			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	10.9	2.7	0.0	0.0	5.2	5.4	9.2	0.0	9.2			
Incr Delay (d2), s/veh	2.2	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	2.7	0.0	0.0	5.4	5.5	9.2	0.0	9.3			
LnGrp LOS	B	A	A	A	A	A	A	A	A			
Approach Vol, veh/h		813			762			31				
Approach Delay, s/veh		2.8			5.4			9.3				
Approach LOS		A			A			A				
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		16.1		6.0	4.1	11.9						
Change Period (Y+Rc), s		5.3		5.3	4.0	5.3						
Max Green Setting (Gmax), s		73.7		45.7	16.0	53.7						
Max Q Clear Time (g_c+l1), s		3.9		2.2	2.0	4.7						
Green Ext Time (p_c), s		3.6		0.0	0.0	2.0						

### Intersection Summary




HCM 6th Ctrl Delay	4.2
HCM 6th LOS	A

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Existing AM Peak Hour

Intersection						
Int Delay, s/veh	14.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	79	343	23	30	373	38
Future Vol, veh/h	79	343	23	30	373	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	84	365	24	32	397	40
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	874	40	0	0	56	0
Stage 1	40	-	-	-	-	-
Stage 2	834	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	323	1037	-	-	1562	-
Stage 1	988	-	-	-	-	-
Stage 2	430	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	239	1037	-	-	1562	-
Mov Cap-2 Maneuver	239	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	318	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	22.9	0		7.3		
HCM LOS	C					
Minor Lane/Major Mvmt		NBT	NBRWBLn1	SBL	SBT	
Capacity (veh/h)		-	-	638	1562	-
HCM Lane V/C Ratio		-	-	0.704	0.254	-
HCM Control Delay (s)		-	-	22.9	8.1	0
HCM Lane LOS		-	-	C	A	A
HCM 95th %tile Q(veh)		-	-	5.7	1	-

# HCM 6th Signalized Intersection Summary 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Existing AM Peak Hour



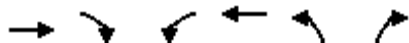
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↰↰↰	↱	↰	↰↰	
Traffic Volume (veh/h)	194	1199	707	77	349	746	
Future Volume (veh/h)	194	1199	707	77	349	746	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1870	1870	1796	1796	
Adj Flow Rate, veh/h	211	1303	768	0	379	490	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	1	1	2	2	7	7	
Cap, veh/h	270	1460	1494		885	1386	
Arrive On Green	0.08	0.41	0.29	0.00	0.52	0.52	
Sat Flow, veh/h	3483	3676	5274	1585	1711	2679	
Grp Volume(v), veh/h	211	1303	768	0	379	490	
Grp Sat Flow(s),veh/h/ln	1742	1791	1702	1585	1711	1340	
Q Serve(g_s), s	7.1	40.7	15.0	0.0	16.5	13.0	
Cycle Q Clear(g_c), s	7.1	40.7	15.0	0.0	16.5	13.0	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	270	1460	1494		885	1386	
V/C Ratio(X)	0.78	0.89	0.51		0.43	0.35	
Avail Cap(c_a), veh/h	421	1955	1979		885	1386	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	54.4	33.1	35.3	0.0	17.9	17.1	
Incr Delay (d2), s/veh	1.9	3.7	0.1	0.0	0.1	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.1	17.3	6.0	0.0	6.5	12.1	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	56.3	36.8	35.5	0.0	18.1	17.2	
LnGrp LOS	E	D	D		B	B	
Approach Vol, veh/h							
		1514	768	A	869		
Approach Delay, s/veh							
		39.5	35.5		17.6		
Approach LOS							
		D	D		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				53.4	66.6	13.8	39.6
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				65.5	45.5	14.5	46.5
Max Q Clear Time (g_c+I1), s				42.7	18.5	9.1	17.0
Green Ext Time (p_c), s				6.2	1.8	0.2	3.3
Intersection Summary							
HCM 6th Ctrl Delay			32.5				
HCM 6th LOS			C				

## Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Existing AM Peak Hour

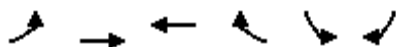







Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	963	585	0	1316	95	21
Future Volume (veh/h)	963	585	0	1316	95	21
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1047	341	0	1430	103	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1721	767	0	1721	1552	712
Arrive On Green	0.48	0.48	0.00	0.48	0.45	0.45
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1047	341	0	1430	103	7
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	25.9	17.0	0.0	41.7	2.0	0.3
Cycle Q Clear(g_c), s	25.9	17.0	0.0	41.7	2.0	0.3
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1721	767	0	1721	1552	712
V/C Ratio(X)	0.61	0.44	0.00	0.83	0.07	0.01
Avail Cap(c_a), veh/h	2636	1176	0	2636	1552	712
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.6	20.3	0.0	26.7	18.8	18.3
Incr Delay (d2), s/veh	0.4	0.4	0.0	1.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	6.3	0.0	16.6	0.8	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.0	20.7	0.0	28.1	18.8	18.3
LnGrp LOS	C	C	A	C	B	B
Approach Vol, veh/h	1388			1430	110	
Approach Delay, s/veh	22.4			28.1	18.8	
Approach LOS	C			C	B	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	57.9			62.1		62.1
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	22.5			88.5		88.5
Max Q Clear Time (g_c+l1), s	4.0			27.9		43.7
Green Ext Time (p_c), s	0.3			12.5		13.9
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			25.1			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Prewett Ranch Drive & Hillcrest Avenue

The Ranch  
Existing AM Peak Hour





















Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	190	38	40	5	5	140	
Future Volume (veh/h)	190	38	40	5	5	140	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	221	44	47	6	6	163	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	289	611	137	17	913	812	
Arrive On Green	0.16	0.33	0.08	0.07	0.51	0.51	
Sat Flow, veh/h	1781	1870	1625	208	1781	1585	
Grp Volume(v), veh/h	221	44	0	53	6	163	
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1833	1781	1585	
Q Serve(g_s), s	5.9	0.8	0.0	1.4	0.1	2.8	
Cycle Q Clear(g_c), s	5.9	0.8	0.0	1.4	0.1	2.8	
Prop In Lane	1.00			0.11	1.00	1.00	
Lane Grp Cap(c), veh/h	289	611	0	154	913	812	
V/C Ratio(X)	0.76	0.07	0.00	0.34	0.01	0.20	
Avail Cap(c_a), veh/h	322	1184	0	681	913	812	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	19.9	11.5	0.0	21.5	5.9	6.6	
Incr Delay (d2), s/veh	9.4	0.0	0.0	1.3	0.0	0.6	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	2.9	0.3	0.0	0.6	0.0	3.5	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	29.4	11.6	0.0	22.8	5.9	7.1	
LnGrp LOS	C	B	A	C	A	A	
Approach Vol, veh/h		265	53		169		
Approach Delay, s/veh		26.4	22.8		7.1		
Approach LOS		C	C		A		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				20.3	29.5	12.1	8.2
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				31.0	25.0	8.5	18.0
Max Q Clear Time (g_c+I1), s				2.8	4.8	7.9	3.4
Green Ext Time (p_c), s				0.2	0.5	0.0	0.1
Intersection Summary							
HCM 6th Ctrl Delay			19.3				
HCM 6th LOS			B				

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Existing PM Peak Hour







												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	193	0	232	567	707	0	0	545	421
Future Volume (veh/h)	0	0	0	193	0	232	567	707	0	0	545	421
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				197	0	42	579	721	0	0	556	116
Peak Hour Factor				0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %				1	0	1	1	1	0	0	1	1
Cap, veh/h				518	0	237	842	2189	0	0	1617	397
Arrive On Green				0.15	0.00	0.15	0.24	0.61	0.00	0.00	0.25	0.25
Sat Flow, veh/h				3483	0	1598	3483	3676	0	0	6749	1591
Grp Volume(v), veh/h				197	0	42	579	721	0	0	556	116
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1742	1791	0	0	1621	1591
Q Serve(g_s), s				1.7	0.0	0.8	5.0	3.3	0.0	0.0	2.3	2.0
Cycle Q Clear(g_c), s				1.7	0.0	0.8	5.0	3.3	0.0	0.0	2.3	2.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				518	0	237	842	2189	0	0	1617	397
V/C Ratio(X)				0.38	0.00	0.18	0.69	0.33	0.00	0.00	0.34	0.29
Avail Cap(c_a), veh/h				4497	0	2063	4707	9572	0	0	7789	1911
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				12.8	0.0	12.4	11.5	3.2	0.0	0.0	10.3	10.1
Incr Delay (d2), s/veh				0.2	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.5	0.0	0.2	1.2	0.0	0.0	0.0	0.5	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				13.0	0.0	12.5	11.9	3.2	0.0	0.0	10.3	10.3
LnGrp LOS				B	A	B	B	A	A	A	B	B
Approach Vol, veh/h					239			1300			672	
Approach Delay, s/veh					12.9			7.0			10.3	
Approach LOS					B			A			B	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	24.4			12.1			12.3			8.9		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	5.3			7.0			4.3			3.7		
Green Ext Time (p_c), s	3.1			1.1			2.5			0.4		
Intersection Summary												
HCM 6th Ctrl Delay	8.7											
HCM 6th LOS	A											

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	455	0	779	0	0	0	0	819	255	269	468	0
Future Volume (veh/h)	455	0	779	0	0	0	0	819	255	269	468	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No							No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	474	0	811				0	853	224	280	488	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1329	0	1183				0	1506	386	410	1642	0
Arrive On Green	0.37	0.00	0.37				0.00	0.29	0.27	0.12	0.46	0.00
Sat Flow, veh/h	3591	0	3195				0	5442	1327	3483	3676	0
Grp Volume(v), veh/h	474	0	811				0	800	277	280	488	0
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1621	1641	1742	1791	0
Q Serve(g_s), s	5.2	0.0	11.6				0.0	7.6	7.9	4.2	4.6	0.0
Cycle Q Clear(g_c), s	5.2	0.0	11.6				0.0	7.6	7.9	4.2	4.6	0.0
Prop In Lane	1.00		1.00				0.00		0.81	1.00		0.00
Lane Grp Cap(c), veh/h	1329	0	1183				0	1414	477	410	1642	0
V/C Ratio(X)	0.36	0.00	0.69				0.00	0.57	0.58	0.68	0.30	0.00
Avail Cap(c_a), veh/h	5632	0	5012				0	2692	908	836	3106	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.4	0.0	14.4				0.0	16.3	16.9	22.9	9.2	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.7				0.0	0.1	0.4	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	3.3				0.0	2.3	2.5	1.5	1.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.5	0.0	15.1				0.0	16.4	17.3	23.7	9.2	0.0
LnGrp LOS	B	A	B				A	B	B	C	A	A
Approach Vol, veh/h	1285							1077		768		
Approach Delay, s/veh	14.2							16.7		14.5		
Approach LOS	B							B		B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	0.4	19.8	24.1	30.1								
Change Period (Y+Rc), s	4.0	5.3	4.5	* 5.3								
Max Green Setting (Gmax), s	3.0	28.7	84.5	* 47								
Max Q Clear Time (g_c+I10), s	2.8	9.9	13.6	6.6								
Green Ext Time (p_c), s	0.3	4.4	5.9	2.0								

### Intersection Summary

HCM 6th Ctrl Delay 15.1  
HCM 6th LOS B

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

















# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	 		 	
Traffic Volume (veh/h)	33	18	101	736	91	162	162	556	766	50	527	29
Future Volume (veh/h)	33	18	101	736	91	162	162	556	766	50	527	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	19	12	759	94	124	167	573	254	52	543	27
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	54	100	63	1053	200	263	216	1004	777	148	840	42
Arrive On Green	0.03	0.09	0.08	0.21	0.27	0.26	0.12	0.28	0.28	0.08	0.24	0.23
Sat Flow, veh/h	1781	1065	673	5023	732	965	1781	3554	2751	1781	3445	171
Grp Volume(v), veh/h	34	0	31	759	0	218	167	573	254	52	280	290
Grp Sat Flow(s),veh/h/ln	1781	0	1737	1674	0	1697	1781	1777	1376	1781	1777	1840
Q Serve(g_s), s	0.9	0.0	0.8	6.8	0.0	5.2	4.4	6.7	3.5	1.3	6.8	6.8
Cycle Q Clear(g_c), s	0.9	0.0	0.8	6.8	0.0	5.2	4.4	6.7	3.5	1.3	6.8	6.8
Prop In Lane	1.00		0.39	1.00		0.57	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	54	0	162	1053	0	463	216	1004	777	148	433	448
V/C Ratio(X)	0.63	0.00	0.19	0.72	0.00	0.47	0.77	0.57	0.33	0.35	0.65	0.65
Avail Cap(c_a), veh/h	369	0	1188	2082	0	1512	849	4935	3820	148	1768	1830
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	0.0	20.3	17.8	0.0	14.8	20.5	14.8	13.7	20.9	16.4	16.4
Incr Delay (d2), s/veh	4.4	0.0	0.2	0.4	0.0	0.3	2.2	0.2	0.1	0.5	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.3	2.1	0.0	1.6	1.6	2.1	0.9	0.5	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.5	0.0	20.5	18.1	0.0	15.1	22.7	15.0	13.8	21.4	17.0	17.0
LnGrp LOS	C	A	C	B	A	B	C	B	B	C	B	B
Approach Vol, veh/h	65		977			994			622			
Approach Delay, s/veh	24.2		17.4			16.0			17.4			
Approach LOS	C		B			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	17.6	14.1	8.5	9.9	15.8	5.5	17.2				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	66.1	20.0	32.4	23.0	47.1	10.0	42.4				
Max Q Clear Time (g_c+I), s	13.3	8.7	8.8	2.8	6.4	8.8	2.9	7.2				
Green Ext Time (p_c), s	0.0	2.9	1.3	0.1	0.2	1.9	0.0	0.8				

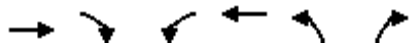
### Intersection Summary

HCM 6th Ctrl Delay	17.0
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Existing PM Peak Hour








Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	235	599	48	488	501	87
Future Volume (veh/h)	235	599	48	488	501	87
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	245	209	50	508	522	21
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	935	413	255	888	807	370
Arrive On Green	0.27	0.27	0.07	0.48	0.24	0.24
Sat Flow, veh/h	3589	1545	3401	1841	3401	1560
Grp Volume(v), veh/h	245	209	50	508	522	21
Grp Sat Flow(s), veh/h/ln	1749	1545	1700	1841	1700	1560
Q Serve(g_s), s	1.6	3.3	0.4	5.6	3.9	0.3
Cycle Q Clear(g_c), s	1.6	3.3	0.4	5.6	3.9	0.3
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	935	413	255	888	807	370
V/C Ratio(X)	0.26	0.51	0.20	0.57	0.65	0.06
Avail Cap(c_a), veh/h	4289	1895	667	2877	2074	951
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.2	8.9	12.4	5.3	9.8	8.4
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.6	0.1	0.4	1.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.3	9.2	12.8	5.5	10.1	8.4
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	454			558	543	
Approach Delay, s/veh	8.7			6.1	10.1	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		10.8	6.1	11.6		17.8
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		17.4	5.1	34.4		44.0
Max Q Clear Time (g_c+I1), s		5.9	2.4	5.3		7.6
Green Ext Time (p_c), s		0.9	0.0	1.2		1.8
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			8.3			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	0	1343	0	0	0	0	1179	431	333	825	0
Future Volume (veh/h)	305	0	1343	0	0	0	0	1179	431	333	825	0
Initial Q (Qb), veh	0	0	20				0	20	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	0	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	311	0	936				0	1203	440	340	842	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	0	1				0	1	1	1	1	0
Cap, veh/h	896	0	700				0	1658	558	419	3397	0
Arrive On Green	0.30	0.00	0.30				0.00	0.43	0.41	0.12	0.61	0.00
Sat Flow, veh/h	3483	0	3643				0	4440	1344	3483	5316	0
Grp Volume(v), veh/h	311	0	936				0	1107	536	340	842	0
Grp Sat Flow(s),veh/h/ln	1742	0	1214				0	1131	1637	1742	1716	0
Q Serve(g_s), s	5.8	0.0	20.3				0.0	23.2	23.4	7.9	6.4	0.0
Cycle Q Clear(g_c), s	5.8	0.0	20.3				0.0	23.2	23.4	7.9	6.4	0.0
Prop In Lane	1.00		1.00				0.00		0.82	1.00		0.00
Lane Grp Cap(c), veh/h	896	0	700				0	1482	711	419	3397	0
V/C Ratio(X)	0.35	0.00	1.34				0.00	0.75	0.75	0.81	0.25	0.00
Avail Cap(c_a), veh/h	1088	0	1138				0	3302	1593	879	5008	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.1	0.0	54.6				0.0	20.8	21.0	44.0	6.7	0.0
Incr Delay (d2), s/veh	0.1	0.0	158.0				0.0	0.3	0.6	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	102.8				0.0	2.9	1.4	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	24.6				0.0	6.7	9.1	4.1	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.2	0.0	315.4				0.0	24.0	23.1	45.5	6.7	0.0
LnGrp LOS	C	A	F				A	C	C	D	A	A
Approach Vol, veh/h	1247						1643			1182		
Approach Delay, s/veh	244.8						23.7			17.9		
Approach LOS	F						C			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	5.3	39.4	28.6	54.7								
Change Period (Y+Rc), s	4.9	* 4.9	5.3	4.9								
Max Green Setting (Gmax), s	1.0	* 80	24.7	80.1								
Max Q Clear Time (g_c+19, s)	25.4		22.3	8.4								
Green Ext Time (p_c), s	0.5	9.1	1.0	3.8								

### Intersection Summary

HCM 6th Ctrl Delay	89.7
HCM 6th LOS	F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Contra Loma Plaza/Davison Drive

The Ranch  
Existing PM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	↰
Traffic Volume (veh/h)	55	46	58	137	32	123	56	712	113	195	889	24
Future Volume (veh/h)	55	46	58	137	32	123	56	712	113	195	889	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	56	47	8	140	33	20	57	727	107	199	907	23
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	100	84	158	233	245	207	80	1041	153	333	1369	35
Arrive On Green	0.10	0.10	0.10	0.13	0.13	0.13	0.04	0.33	0.32	0.10	0.38	0.37
Sat Flow, veh/h	998	837	1574	1795	1885	1594	1795	3126	460	3483	3569	90
Grp Volume(v), veh/h	103	0	8	140	33	20	57	416	418	199	455	475
Grp Sat Flow(s),veh/h/ln	1835	0	1574	1795	1885	1594	1795	1791	1795	1742	1791	1868
Q Serve(g_s), s	2.5	0.0	0.2	3.4	0.7	0.5	1.5	9.5	9.5	2.6	9.8	9.8
Cycle Q Clear(g_c), s	2.5	0.0	0.2	3.4	0.7	0.5	1.5	9.5	9.5	2.6	9.8	9.8
Prop In Lane	0.54		1.00	1.00		1.00	1.00		0.26	1.00		0.05
Lane Grp Cap(c), veh/h	184	0	158	233	245	207	80	596	598	333	687	717
V/C Ratio(X)	0.56	0.00	0.05	0.60	0.13	0.10	0.71	0.70	0.70	0.60	0.66	0.66
Avail Cap(c_a), veh/h	1372	0	1176	1457	1530	1293	613	2868	2875	1190	2868	2992
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.1	0.0	19.1	19.2	18.1	18.0	22.1	13.6	13.7	20.3	11.9	11.9
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.9	0.1	0.1	4.3	0.6	0.6	0.6	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.1	1.2	0.3	0.2	0.6	2.9	2.9	1.0	3.2	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.1	0.0	19.1	20.2	18.1	18.0	26.3	14.1	14.2	21.0	12.3	12.3
LnGrp LOS	C	A	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		111			193			891			1129	
Approach Delay, s/veh		20.9			19.6			15.0			13.9	
Approach LOS		C			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.5	19.6		8.7	6.1	22.0		10.1				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+14), s	14.6	11.5		4.5	3.5	11.8		5.4				
Green Ext Time (p_c), s	0.3	3.1		0.3	0.0	4.3		0.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			15.1									
HCM 6th LOS			B									

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	162	101	39	84	503	117	756	33	747	929	160
Future Volume (veh/h)	166	162	101	39	84	503	117	756	33	747	929	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	171	167	37	40	87	519	121	779	33	770	958	165
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	207	772	167	51	632	1180	310	982	42	870	1229	702
Arrive On Green	0.12	0.26	0.26	0.03	0.18	0.17	0.17	0.28	0.27	0.25	0.34	0.33
Sat Flow, veh/h	1795	2928	634	1795	3582	2812	1795	3500	148	3483	3582	1576
Grp Volume(v), veh/h	171	101	103	40	87	519	121	398	414	770	958	165
Grp Sat Flow(s),veh/h/ln	1795	1791	1771	1795	1791	1406	1795	1791	1858	1742	1791	1576
Q Serve(g_s), s	8.4	3.9	4.1	2.0	1.8	11.8	5.4	18.5	18.6	19.2	21.6	2.3
Cycle Q Clear(g_c), s	8.4	3.9	4.1	2.0	1.8	11.8	5.4	18.5	18.6	19.2	21.6	2.3
Prop In Lane	1.00		0.36	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	207	472	467	51	632	1180	310	503	521	870	1229	702
V/C Ratio(X)	0.82	0.21	0.22	0.79	0.14	0.44	0.39	0.79	0.79	0.89	0.78	0.23
Avail Cap(c_a), veh/h	439	1432	1416	219	2426	2588	310	994	1031	1199	2784	1386
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.9	25.9	26.0	43.5	31.3	18.6	33.0	30.0	30.0	32.5	26.5	5.2
Incr Delay (d2), s/veh	3.2	0.1	0.1	9.8	0.0	0.1	0.3	1.1	1.1	5.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	1.6	1.7	1.0	0.8	3.5	2.2	7.5	7.8	8.5	8.9	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	25.9	26.1	53.3	31.3	18.7	33.3	31.1	31.1	37.5	26.9	5.2
LnGrp LOS	D	C	C	D	C	B	C	C	C	D	C	A
Approach Vol, veh/h	375			646			933			1893		
Approach Delay, s/veh	33.4			22.5			31.4			29.4		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.5	29.3	6.5	27.8	20.9	34.9	14.4	19.9				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	11.0	48.7	11.0	71.4	11.0	* 69	22.0	60.4				
Max Q Clear Time (g_c+Y), s	21.2	20.6	4.0	6.1	7.4	23.6	10.4	13.8				
Green Ext Time (p_c), s	1.3	2.9	0.0	0.7	0.0	5.7	0.2	1.5				

### Intersection Summary

HCM 6th Ctrl Delay	29.1
HCM 6th LOS	C

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	77	734	6	41	54	471	682	9	58	906	158
Future Volume (veh/h)	134	77	734	6	41	54	471	682	9	58	906	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	111	123	95	6	43	3	496	718	4	61	954	166
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	224	235	399	9	66	64	650	1783	775	79	1508	262
Arrive On Green	0.12	0.12	0.12	0.04	0.04	0.04	0.19	0.50	0.50	0.04	0.34	0.33
Sat Flow, veh/h	1795	1885	3195	229	1644	1598	3483	3582	1557	1795	4403	764
Grp Volume(v), veh/h	111	123	95	49	0	3	496	718	4	61	743	377
Grp Sat Flow(s),veh/h/ln	1795	1885	1598	1874	0	1598	1742	1791	1557	1795	1716	1735
Q Serve(g_s), s	3.1	3.3	1.5	1.4	0.0	0.1	7.4	6.9	0.1	1.8	9.9	10.0
Cycle Q Clear(g_c), s	3.1	3.3	1.5	1.4	0.0	0.1	7.4	6.9	0.1	1.8	9.9	10.0
Prop In Lane	1.00		1.00	0.12		1.00	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	224	235	399	75	0	64	650	1783	775	79	1175	594
V/C Ratio(X)	0.50	0.52	0.24	0.65	0.00	0.05	0.76	0.40	0.01	0.77	0.63	0.63
Avail Cap(c_a), veh/h	724	760	1288	1339	0	1142	1596	3544	1541	296	2389	1208
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	22.4	21.5	25.8	0.0	25.2	21.0	8.6	6.9	25.8	15.1	15.2
Incr Delay (d2), s/veh	0.6	0.7	0.1	3.6	0.0	0.1	0.7	0.1	0.0	5.7	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.3	0.5	0.6	0.0	0.0	2.6	1.8	0.0	0.9	3.4	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	23.0	21.7	29.4	0.0	25.3	21.8	8.7	6.9	31.5	15.3	15.6
LnGrp LOS	C	C	C	C	A	C	C	A	A	C	B	B
Approach Vol, veh/h	329			52			1218			1181		
Approach Delay, s/veh	22.6			29.2			14.0			16.2		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	31.2		10.8	14.2	23.4		6.2				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	9.0	52.7		21.1	25.0	* 37		39.0				
Max Q Clear Time (g_c+13, s)	8.9			5.3	9.4	12.0		3.4				
Green Ext Time (p_c), s	0.0	3.1		0.6	0.8	5.7		0.1				

### Intersection Summary

HCM 6th Ctrl Delay 16.2  
HCM 6th LOS B

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱ ↱ ↱			↰ ↱ ↱ ↱			↰ ↱		↰	↰	↰	↱
Traffic Volume (veh/h)	104	935	257	106	673	39	199	54	85	48	31	78
Future Volume (veh/h)	104	935	257	106	673	39	199	54	85	48	31	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	108	974	194	110	701	15	207	56	25	50	32	17
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	140	1473	293	180	1892	40	334	372	312	72	163	87
Arrive On Green	0.08	0.34	0.34	0.10	0.37	0.36	0.10	0.20	0.20	0.04	0.14	0.12
Sat Flow, veh/h	1795	4296	853	1795	5183	111	3483	1885	1585	1795	1155	614
Grp Volume(v), veh/h	108	777	391	110	464	252	207	56	25	50	0	49
Grp Sat Flow(s),veh/h/ln	1795	1716	1719	1795	1716	1862	1742	1885	1585	1795	0	1769
Q Serve(g_s), s	3.0	9.6	9.7	2.9	5.0	5.0	2.9	1.2	0.6	1.4	0.0	1.2
Cycle Q Clear(g_c), s	3.0	9.6	9.7	2.9	5.0	5.0	2.9	1.2	0.6	1.4	0.0	1.2
Prop In Lane	1.00		0.50	1.00		0.06	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	140	1176	589	180	1253	680	334	372	312	72	0	250
V/C Ratio(X)	0.77	0.66	0.66	0.61	0.37	0.37	0.62	0.15	0.08	0.70	0.00	0.20
Avail Cap(c_a), veh/h	610	3632	1819	610	3632	1972	974	1695	1425	323	0	1413
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.6	14.0	14.0	21.6	11.7	11.7	21.7	16.6	16.4	23.7	0.0	19.2
Incr Delay (d2), s/veh	3.3	0.2	0.5	1.2	0.1	0.1	0.7	0.1	0.0	4.4	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.8	2.9	1.1	1.4	1.6	1.0	0.4	0.2	0.6	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.9	14.2	14.5	22.8	11.7	11.8	22.4	16.7	16.4	28.2	0.0	19.3
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	A	B
Approach Vol, veh/h	1276		826				288			99		
Approach Delay, s/veh	15.3		13.2				20.8			23.8		
Approach LOS	B		B				C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.0	13.9	9.0	21.2	8.8	11.1	7.9	22.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	43.7	43.7	17.0	* 53	14.0	38.7	17.0	* 53				
Max Q Clear Time (g_c+13.4), s	3.2	3.2	4.9	11.7	4.9	3.2	5.0	7.0				
Green Ext Time (p_c), s	0.0	0.2	0.1	5.3	0.2	0.1	0.1	2.8				

### Intersection Summary

HCM 6th Ctrl Delay 15.6

HCM 6th LOS B

### Notes



























\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Existing PM Peak Hour






												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	67	735	156	191	524	176	210	304	162	252	259	24
Future Volume (veh/h)	67	735	156	191	524	176	210	304	162	252	259	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	70	766	44	199	546	69	219	317	114	262	270	25
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	90	1391	80	249	1708	213	330	571	201	379	780	72
Arrive On Green	0.05	0.28	0.26	0.14	0.37	0.34	0.09	0.22	0.20	0.11	0.23	0.21
Sat Flow, veh/h	1810	5010	286	1810	4671	582	3510	2604	917	3510	3340	307
Grp Volume(v), veh/h	70	528	282	199	402	213	219	218	213	262	145	150
Grp Sat Flow(s),veh/h/ln	1810	1729	1838	1810	1729	1795	1755	1805	1716	1755	1805	1842
Q Serve(g_s), s	2.4	8.1	8.2	6.6	5.2	5.4	3.8	6.7	6.9	4.5	4.2	4.2
Cycle Q Clear(g_c), s	2.4	8.1	8.2	6.6	5.2	5.4	3.8	6.7	6.9	4.5	4.2	4.2
Prop In Lane	1.00		0.16	1.00		0.32	1.00		0.53	1.00		0.17
Lane Grp Cap(c), veh/h	90	960	510	249	1264	656	330	396	377	379	422	430
V/C Ratio(X)	0.78	0.55	0.55	0.80	0.32	0.32	0.66	0.55	0.57	0.69	0.34	0.35
Avail Cap(c_a), veh/h	320	2334	1241	727	3112	1616	790	1189	1131	903	1247	1273
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	19.2	19.3	26.0	14.2	14.4	27.2	21.6	22.0	26.7	19.9	20.0
Incr Delay (d2), s/veh	5.3	0.2	0.3	2.2	0.1	0.1	0.9	0.4	0.5	0.8	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.8	3.0	2.7	1.7	1.8	1.5	2.5	2.5	1.7	1.5	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.6	19.3	19.6	28.2	14.2	14.5	28.1	22.0	22.5	27.6	20.1	20.2
LnGrp LOS	C	B	B	C	B	B	C	C	C	C	C	C
Approach Vol, veh/h		880			814			650			557	
Approach Delay, s/veh		20.6			17.7			24.2			23.6	
Approach LOS		C			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.7	17.7	12.6	21.3	9.8	18.5	7.1	26.7				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7				
Max Q Clear Time (g_c+I1), s	6.5	8.9	8.6	10.2	5.8	6.2	4.4	7.4				
Green Ext Time (p_c), s	0.3	1.5	0.2	3.2	0.2	0.9	0.0	2.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				21.2								
HCM 6th LOS				C								

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	171	835	15	70	868	227	31	48	37	523	87	98
Future Volume (veh/h)	171	835	15	70	868	227	31	48	37	523	87	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	178	870	6	73	904	59	32	50	5	545	91	102
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	223	1867	13	94	1451	444	49	467	46	674	1104	483
Arrive On Green	0.12	0.35	0.33	0.05	0.28	0.28	0.03	0.14	0.12	0.19	0.31	0.31
Sat Flow, veh/h	1795	5273	36	1795	5147	1574	1795	3289	324	3483	3582	1568
Grp Volume(v), veh/h	178	566	310	73	904	59	32	27	28	545	91	102
Grp Sat Flow(s),veh/h/ln	1795	1716	1879	1795	1716	1574	1795	1791	1822	1742	1791	1568
Q Serve(g_s), s	6.0	7.9	7.9	2.5	9.5	1.7	1.1	0.8	0.8	9.3	1.1	3.0
Cycle Q Clear(g_c), s	6.0	7.9	7.9	2.5	9.5	1.7	1.1	0.8	0.8	9.3	1.1	3.0
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	223	1215	665	94	1451	444	49	254	259	674	1104	483
V/C Ratio(X)	0.80	0.47	0.47	0.78	0.62	0.13	0.65	0.11	0.11	0.81	0.08	0.21
Avail Cap(c_a), veh/h	406	2729	1494	319	3844	1176	145	1292	1314	1068	3392	1485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.4	15.5	15.5	29.0	19.4	16.6	29.9	23.2	23.3	23.9	15.2	15.9
Incr Delay (d2), s/veh	2.5	0.1	0.2	5.2	0.2	0.0	5.3	0.1	0.1	1.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	2.6	2.9	1.1	3.2	0.5	0.5	0.3	0.3	3.4	0.4	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.9	15.6	15.7	34.2	19.5	16.7	35.2	23.2	23.3	25.0	15.2	15.9
LnGrp LOS	C	B	B	C	B	B	D	C	C	C	B	B
Approach Vol, veh/h	1054			1036			87			738		
Approach Delay, s/veh	17.9			20.4			27.7			22.5		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.8	7.2	26.0	5.7	23.1	11.7	21.5					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	11.0	48.0	5.0	57.4	14.0	45.0					
Max Q Clear Time (g_c+I1), s	2.8	4.5	9.9	3.1	5.0	8.0	11.5					
Green Ext Time (p_c), s	0.7	0.1	0.0	3.5	0.0	0.5	0.1	4.2				

### Intersection Summary

HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1529	648	152	1537	0	0	0	0	674	3	652
Future Volume (veh/h)	0	1529	648	152	1537	0	0	0	0	674	3	652
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1609	288	160	1618	0				711	0	658
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1876	571	192	2555	0				1588	0	706
Arrive On Green	0.00	0.36	0.36	0.10	0.49	0.00				0.44	0.00	0.44
Sat Flow, veh/h	0	5358	1579	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	1609	288	160	1618	0				711	0	658
Grp Sat Flow(s),veh/h/ln	0	1729	1579	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	33.4	16.6	9.2	26.8	0.0				16.0	0.0	45.1
Cycle Q Clear(g_c), s	0.0	33.4	16.6	9.2	26.8	0.0				16.0	0.0	45.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1876	571	192	2555	0				1588	0	706
V/C Ratio(X)	0.00	0.86	0.50	0.83	0.63	0.00				0.45	0.00	0.93
Avail Cap(c_a), veh/h	0	2051	624	274	2942	0				2053	0	913
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	34.4	29.0	51.6	21.8	0.0				22.8	0.0	31.0
Incr Delay (d2), s/veh	0.0	3.3	0.3	9.7	0.2	0.0				0.1	0.0	12.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.8	6.0	2.5	10.1	0.0				6.5	0.0	18.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	37.7	29.3	61.4	22.0	0.0				22.9	0.0	43.1
LnGrp LOS	A	D	C	E	C	A				C	A	D
Approach Vol, veh/h		1897			1778						1369	
Approach Delay, s/veh		36.4			25.5						32.6	
Approach LOS		D			C						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.2	46.1		55.0		61.3						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	6.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I1), s	11.2	35.4		47.1		28.8						
Green Ext Time (p_c), s	0.1	5.4		2.6		9.1						

## Intersection Summary

HCM 6th Ctrl Delay	31.5
HCM 6th LOS	C

## Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1764	439	38	1030	453	659	38	243	0	0	0
Future Volume (veh/h)	0	1764	439	38	1030	453	659	38	243	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	0	1857	298	40	1084	268	723	0	256			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	1	1	1	1	1	1	1	1			
Cap, veh/h	0	2630	804	57	3122	942	956	0	425			
Arrive On Green	0.00	0.51	0.51	0.03	0.61	0.61	0.27	0.00	0.27			
Sat Flow, veh/h	0	5316	1573	1795	5147	1553	3591	0	1598			
Grp Volume(v), veh/h	0	1857	298	40	1084	268	723	0	256			
Grp Sat Flow(s),veh/h/ln	0	1716	1573	1795	1716	1553	1795	0	1598			
Q Serve(g_s), s	0.0	17.4	7.2	1.4	6.6	5.2	11.6	0.0	8.8			
Cycle Q Clear(g_c), s	0.0	17.4	7.2	1.4	6.6	5.2	11.6	0.0	8.8			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2630	804	57	3122	942	956	0	425			
V/C Ratio(X)	0.00	0.71	0.37	0.70	0.35	0.28	0.76	0.00	0.60			
Avail Cap(c_a), veh/h	0	3927	1200	314	5154	1556	2797	0	1244			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	11.8	9.3	30.1	6.2	5.9	21.2	0.0	20.2			
Incr Delay (d2), s/veh	0.0	0.1	0.1	5.6	0.0	0.1	0.5	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	4.8	1.9	0.6	1.5	1.1	4.2	0.0	2.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.9	9.4	35.7	6.2	5.9	21.7	0.0	20.7			
LnGrp LOS	A	B	A	D	A	A	C	A	C			
Approach Vol, veh/h		2155			1392			979				
Approach Delay, s/veh		11.5			7.0			21.4				
Approach LOS		B			A			C				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	6.0	36.1		20.7		42.2						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	1.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+I), s	13.4	19.4		13.6		8.6						
Green Ext Time (p_c), s	0.0	11.4		1.8		5.8						

## Intersection Summary

HCM 6th Ctrl Delay 12.3  
HCM 6th LOS B

## Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	51	0	9	47	150	5	53	9	186	97	38
Future Volume (veh/h)	34	51	0	9	47	150	5	53	9	186	97	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	37	55	0	10	51	70	5	57	1	200	104	41
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	207	179	0	207	68	94	207	574	10	302	539	202
Arrive On Green	0.12	0.09	0.00	0.12	0.09	0.09	0.12	0.16	0.12	0.17	0.21	0.17
Sat Flow, veh/h	1795	1885	0	1795	720	988	1795	3602	63	1795	2543	954
Grp Volume(v), veh/h	37	55	0	10	0	121	5	28	30	200	72	73
Grp Sat Flow(s),veh/h/ln	1795	1885	0	1795	0	1707	1795	1791	1874	1795	1791	1707
Q Serve(g_s), s	0.6	0.9	0.0	0.2	0.0	2.4	0.1	0.5	0.5	3.6	1.1	1.3
Cycle Q Clear(g_c), s	0.6	0.9	0.0	0.2	0.0	2.4	0.1	0.5	0.5	3.6	1.1	1.3
Prop In Lane	1.00		0.00	1.00		0.58	1.00		0.03	1.00		0.56
Lane Grp Cap(c), veh/h	207	179	0	207	0	162	207	285	298	302	380	362
V/C Ratio(X)	0.18	0.31	0.00	0.05	0.00	0.75	0.02	0.10	0.10	0.66	0.19	0.20
Avail Cap(c_a), veh/h	570	1960	0	570	0	1775	1089	2638	2760	1089	2638	2514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.8	14.6	0.0	13.6	0.0	15.3	13.6	12.4	12.5	13.5	11.2	11.5
Incr Delay (d2), s/veh	0.2	0.4	0.0	0.0	0.0	2.6	0.0	0.1	0.1	0.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.0	0.1	0.0	0.8	0.0	0.1	0.1	1.1	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.0	15.0	0.0	13.7	0.0	17.8	13.6	12.5	12.5	14.4	11.3	11.6
LnGrp LOS	B	B	A	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	92			131			63			345		
Approach Delay, s/veh	14.6			17.5			12.6			13.2		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	9.5	8.0	7.3	8.0	11.3	8.0	7.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+15), s	2.5	2.5	2.2	2.9	2.1	3.3	2.6	4.4				
Green Ext Time (p_c), s	0.2	0.2	0.0	0.1	0.0	0.5	0.0	0.4				

### Intersection Summary









HCM 6th Ctrl Delay	14.2
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	105	56	44	90	72	123	448	138	107	384	88
Future Volume (veh/h)	65	105	56	44	90	72	123	448	138	107	384	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	70	113	42	47	97	47	132	482	121	115	413	77
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	102	166	62	76	134	65	173	852	213	149	865	160
Arrive On Green	0.06	0.13	0.13	0.04	0.11	0.11	0.10	0.30	0.26	0.08	0.28	0.25
Sat Flow, veh/h	1810	1321	491	1810	1209	586	1810	2862	714	1810	3041	563
Grp Volume(v), veh/h	70	0	155	47	0	144	132	303	300	115	244	246
Grp Sat Flow(s),veh/h/ln	1810	0	1812	1810	0	1795	1810	1805	1771	1810	1805	1799
Q Serve(g_s), s	1.3	0.0	2.9	0.9	0.0	2.7	2.5	5.0	5.1	2.2	3.9	4.0
Cycle Q Clear(g_c), s	1.3	0.0	2.9	0.9	0.0	2.7	2.5	5.0	5.1	2.2	3.9	4.0
Prop In Lane	1.00		0.27	1.00		0.33	1.00		0.40	1.00		0.31
Lane Grp Cap(c), veh/h	102	0	227	76	0	199	173	537	527	149	514	512
V/C Ratio(X)	0.69	0.00	0.68	0.62	0.00	0.72	0.77	0.56	0.57	0.77	0.47	0.48
Avail Cap(c_a), veh/h	563	0	1897	512	0	1828	973	2043	2005	871	1941	1934
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.4	0.0	14.8	16.7	0.0	15.2	15.6	10.5	10.7	15.9	10.5	10.7
Incr Delay (d2), s/veh	3.1	0.0	1.3	3.1	0.0	1.9	2.7	0.3	0.4	3.2	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.9	0.3	0.0	0.9	0.9	1.3	1.3	0.8	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.4	0.0	16.1	19.7	0.0	17.0	18.3	10.8	11.1	19.1	10.7	10.9
LnGrp LOS	B	A	B	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	225		191			735			605			
Approach Delay, s/veh	17.2		17.7			12.3			12.4			
Approach LOS	B		B			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.9	14.5	5.5	8.4	7.4	14.1	6.0	7.9				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	7.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0				
Max Q Clear Time (g_c+14), s	14.2	7.1	2.9	4.9	4.5	6.0	3.3	4.7				
Green Ext Time (p_c), s	0.1	2.1	0.0	0.5	0.1	1.6	0.0	0.4				

### Intersection Summary

HCM 6th Ctrl Delay	13.5
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Existing PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	29	249	531	4	53	424
Future Volume (veh/h)	29	249	531	4	53	424
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	34	9	617	5	62	493
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	76	67	1381	602	103	1164
Arrive On Green	0.04	0.04	0.38	0.38	0.06	0.61
Sat Flow, veh/h	1810	1610	3705	1574	1810	1900
Grp Volume(v), veh/h	34	9	617	5	62	493
Grp Sat Flow(s), veh/h/ln	1810	1610	1805	1574	1810	1900
Q Serve(g_s), s	0.4	0.1	2.9	0.0	0.8	3.1
Cycle Q Clear(g_c), s	0.4	0.1	2.9	0.0	0.8	3.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	76	67	1381	602	103	1164
V/C Ratio(X)	0.45	0.13	0.45	0.01	0.60	0.42
Avail Cap(c_a), veh/h	2660	2367	6399	2791	2582	6407
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.8	10.7	5.3	4.4	10.7	2.3
Incr Delay (d2), s/veh	1.6	0.3	0.1	0.0	2.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.2	0.0	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.4	11.0	5.4	4.4	12.8	2.4
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	43		622			555
Approach Delay, s/veh	12.1		5.4			3.6
Approach LOS	B		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.3	12.9			18.2	5.0
Change Period (Y+Rc), s	4.0	5.3			5.3	4.0
Max Green Setting (Gmax), s	33.0	39.7			76.7	34.0
Max Q Clear Time (g_c+I), s	12.8	4.9			5.1	2.4
Green Ext Time (p_c), s	0.1	2.5			1.8	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			4.8			
HCM 6th LOS			A			



# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Existing PM Peak Hour











Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Volume (veh/h)	4	0	0	74	0	57	1	259	37	24	270	0
Future Volume (veh/h)	4	0	0	74	0	57	1	259	37	24	270	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	5	0	0	84	0	6	1	294	37	27	307	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	376	0	0	459	0	124	8	572	72	50	707	0
Arrive On Green	0.08	0.00	0.00	0.08	0.00	0.08	0.00	0.35	0.29	0.03	0.37	0.00
Sat Flow, veh/h	597	0	0	1672	0	1610	1810	1654	208	1810	1900	0
Grp Volume(v), veh/h	5	0	0	84	0	6	1	0	331	27	307	0
Grp Sat Flow(s), veh/h/ln	597	0	0	1672	0	1610	1810	0	1863	1810	1900	0
Q Serve(g_s), s	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	3.1	0.3	2.6	0.0
Cycle Q Clear(g_c), s	1.1	0.0	0.0	1.0	0.0	0.1	0.0	0.0	3.1	0.3	2.6	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.11	1.00		0.00
Lane Grp Cap(c), veh/h	376	0	0	459	0	124	8	0	643	50	707	0
V/C Ratio(X)	0.01	0.00	0.00	0.18	0.00	0.05	0.12	0.00	0.51	0.54	0.43	0.00
Avail Cap(c_a), veh/h	2562	0	0	2657	0	2582	912	0	6144	1741	7138	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.3	0.0	0.0	9.7	0.0	9.3	10.9	0.0	5.7	10.5	5.1	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	0.1	2.4	0.0	0.2	3.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.1	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.3	0.0	0.0	9.8	0.0	9.4	13.2	0.0	6.0	13.8	5.3	0.0
LnGrp LOS	B	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h	5			90			332			334		
Approach Delay, s/veh	10.3			9.8			6.0			6.0		
Approach LOS	B			A			A			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	11.5		5.7	4.0	12.1		5.7				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	1.0	70.7		35.0	11.0	80.7		35.0				
Max Q Clear Time (g_c+12, s)	1.0	5.1		3.1	2.0	4.6		3.0				
Green Ext Time (p_c), s	0.0	1.1		0.0	0.0	1.2		0.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	6.5											
HCM 6th LOS	A											

# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Existing PM Peak Hour

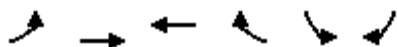







Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	5	9	0	5	9	0	5	3184	0	5	3184	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3647	0	1781	3647	0	1781	3647	0
Grp Volume(v), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	0	1781	1777	0	1781	1777	0
Q Serve(g_s), 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
Cycle Q Clear(g_c), 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
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	5	9	0	5	9	0	5	3184	0	5	3184	0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	254	3184	0	254	3184	0	254	3184	0	254	3184	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h	0		0				0		0			
Approach Delay, s/veh	0.0		0.0				0.0		0.0			
Approach LOS												
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	0.0	38.5	0.0	0.0	0.0	38.5	0.0	0.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	34.0	5.0	34.0	5.0	34.0	5.0	34.0				
Max Q Clear Time (g_c+10), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			0.0									
HCM 6th LOS			A									

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

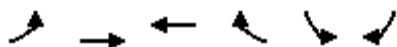
The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	4	8	8	0	1625	1446
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	7294	0	1781	1585
Grp Volume(v), veh/h	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	0	1781	1585
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	4	8	8	0	1625	1446
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	1224	6205	3453	0	1625	1446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		0	0		0	
Approach Delay, s/veh		0.0	0.0		0.0	
Approach LOS						
Timer - Assigned Phs			4		6	7 8
Phs Duration (G+Y+Rc), s			0.0		45.7	0.0 0.0
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			79.3		41.2	30.9 43.9
Max Q Clear Time (g_c+I1), s			0.0		0.0	0.0 0.0
Green Ext Time (p_c), s			0.0		0.0	0.0 0.0
Intersection Summary						
HCM 6th Ctrl Delay			0.0			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	147	1294	0
Future Volume (veh/h)	0	0	0	147	1294	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	0	0	0	11	1407	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	321	132	132	112	2014	924
Arrive On Green	0.00	0.00	0.00	0.07	0.57	0.00
Sat Flow, veh/h	1426	1900	1900	1610	3510	1610
Grp Volume(v), veh/h	0	0	0	11	1407	0
Grp Sat Flow(s), veh/h/ln	1426	1900	1900	1610	1755	1610
Q Serve(g_s), s	0.0	0.0	0.0	0.1	6.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.1	6.4	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	321	132	132	112	2014	924
V/C Ratio(X)	0.00	0.00	0.00	0.10	0.70	0.00
Avail Cap(c_a), veh/h	1047	1101	1101	933	12356	5668
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	9.8	3.4	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	9.9	3.6	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		0	11		1407	
Approach Delay, s/veh		0.0	9.9		3.6	
Approach LOS			A		A	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		5.6			5.6	16.9
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		11.7			11.7	77.7
Max Q Clear Time (g_c+I1), s		0.0			2.1	8.4
Green Ext Time (p_c), s		0.0			0.0	3.2

## Intersection Summary

HCM 6th Ctrl Delay	3.6
HCM 6th LOS	A








## Notes

User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1284	0	0	143	902	4	5	196	0	0	0
Future Volume (veh/h)	10	1284	0	0	143	902	4	5	196	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	11	1352	0	0	151	462	4	5	206			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	41	2714	0	0	715	1212	373	392	332			
Arrive On Green	0.01	0.52	0.00	0.00	0.38	0.38	0.21	0.21	0.21			
Sat Flow, veh/h	3510	5358	0	0	1900	3220	1810	1900	1610			
Grp Volume(v), veh/h	11	1352	0	0	151	462	4	5	206			
Grp Sat Flow(s),veh/h/ln	1755	1729	0	0	1900	1610	1810	1900	1610			
Q Serve(g_s), s	0.1	5.0	0.0	0.0	1.6	3.1	0.1	0.1	3.4			
Cycle Q Clear(g_c), s	0.1	5.0	0.0	0.0	1.6	3.1	0.1	0.1	3.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	41	2714	0	0	715	1212	373	392	332			
V/C Ratio(X)	0.27	0.50	0.00	0.00	0.21	0.38	0.01	0.01	0.62			
Avail Cap(c_a), veh/h	1899	13154	0	0	3533	5989	2876	3019	2559			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	14.5	4.5	0.0	0.0	6.2	6.7	9.3	9.3	10.7			
Incr Delay (d2), s/veh	1.3	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.0	0.0	0.3	0.4	0.0	0.0	3.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.8	4.6	0.0	0.0	6.3	6.8	9.3	9.3	11.4			
LnGrp LOS	B	A	A	A	A	A	A	A	B			
Approach Vol, veh/h	1363		613			215						
Approach Delay, s/veh	4.7		6.7			11.3						
Approach LOS	A		A			B						
Timer - Assigned Phs	2		4		5	6						
Phs Duration (G+Y+Rc), s	19.5		10.1		4.3	15.1						
Change Period (Y+Rc), s	5.3		5.3		4.0	5.3						
Max Green Setting (Gmax), s	73.7		45.7		16.0	53.7						
Max Q Clear Time (g_c+I1), s	7.0		5.4		2.1	5.1						
Green Ext Time (p_c), s	7.2		0.3		0.0	1.5						

## Intersection Summary




HCM 6th Ctrl Delay	5.9
HCM 6th LOS	A

## Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Existing PM Peak Hour

Intersection						
Int Delay, s/veh	10.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	370	38	35	323	30
Future Vol, veh/h	34	370	38	35	323	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	37	407	42	38	355	33
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	804	61	0	0	80	0
Stage 1	61	-	-	-	-	-
Stage 2	743	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	355	1010	-	-	1531	-
Stage 1	967	-	-	-	-	-
Stage 2	474	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	271	1010	-	-	1531	-
Mov Cap-2 Maneuver	271	-	-	-	-	-
Stage 1	967	-	-	-	-	-
Stage 2	362	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	14.4	0		7.4		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	821	1531	-	
HCM Lane V/C Ratio	-	-	0.541	0.232	-	
HCM Control Delay (s)	-	-	14.4	8.1	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	3.3	0.9	-	

# HCM 6th Signalized Intersection Summary 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Existing PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↱↱	↰	↰	↰↰	
Traffic Volume (veh/h)	74	1241	767	30	571	576	
Future Volume (veh/h)	74	1241	767	30	571	576	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	79	1320	816	0	607	574	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	153	1471	1190		920	1565	
Arrive On Green	0.04	0.41	0.33	0.00	0.52	0.52	
Sat Flow, veh/h	3456	3647	3647	1585	1781	2790	
Grp Volume(v), veh/h	79	1320	816	0	607	574	
Grp Sat Flow(s),veh/h/ln	1728	1777	1777	1585	1781	1395	
Q Serve(g_s), s	2.6	39.8	22.8	0.0	28.7	13.1	
Cycle Q Clear(g_c), s	2.6	39.8	22.8	0.0	28.7	13.1	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	153	1471	1190		920	1565	
V/C Ratio(X)	0.52	0.90	0.69		0.66	0.37	
Avail Cap(c_a), veh/h	361	1740	1245		920	1565	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	53.7	31.4	33.0	0.0	20.4	14.0	
Incr Delay (d2), s/veh	1.0	5.3	1.2	0.0	1.4	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.1	17.0	9.6	0.0	11.9	13.2	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	54.7	36.8	34.2	0.0	21.8	14.0	
LnGrp LOS	D	D	C		C	B	
Approach Vol, veh/h		1399	816	A	1181		
Approach Delay, s/veh		37.8	34.2		18.0		
Approach LOS		D	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				51.6	63.4	9.1	42.5
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				55.8	50.2	11.5	39.8
Max Q Clear Time (g_c+I1), s				41.8	30.7	4.6	24.8
Green Ext Time (p_c), s				5.3	2.4	0.0	3.0
Intersection Summary							
HCM 6th Ctrl Delay			30.0				
HCM 6th LOS			C				

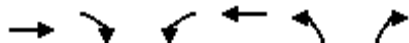
## Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Existing PM Peak Hour

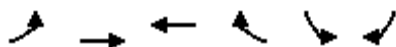







Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	1315	497	0	1169	139	65
Future Volume (veh/h)	1315	497	0	1169	139	65
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1429	327	0	1271	151	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1812	808	0	1812	1453	666
Arrive On Green	0.51	0.51	0.00	0.51	0.42	0.42
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1429	327	0	1271	151	17
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	37.9	14.6	0.0	31.4	3.0	0.7
Cycle Q Clear(g_c), s	37.9	14.6	0.0	31.4	3.0	0.7
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1812	808	0	1812	1453	666
V/C Ratio(X)	0.79	0.40	0.00	0.70	0.10	0.03
Avail Cap(c_a), veh/h	2565	1144	0	2565	1453	666
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	17.4	0.0	21.5	20.2	19.5
Incr Delay (d2), s/veh	1.1	0.3	0.0	0.5	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	5.3	0.0	12.1	1.3	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.2	17.7	0.0	22.0	20.3	19.6
LnGrp LOS	C	B	A	C	C	B
Approach Vol, veh/h	1756			1271	168	
Approach Delay, s/veh	23.0			22.0	20.3	
Approach LOS	C			C	C	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	52.3			62.7		62.7
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	23.5			82.5		82.5
Max Q Clear Time (g_c+I1), s	5.0			39.9		33.4
Green Ext Time (p_c), s	0.5			18.3		11.7
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			22.5			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Prewett Ranch Drive & Hillcrest Avenue

The Ranch  
Existing PM Peak Hour










Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	169	29	21	4	7	145	
Future Volume (veh/h)	169	29	21	4	7	145	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	180	31	22	4	7	154	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	247	542	102	19	963	857	
Arrive On Green	0.14	0.29	0.07	0.06	0.54	0.54	
Sat Flow, veh/h	1781	1870	1540	280	1781	1585	
Grp Volume(v), veh/h	180	31	0	26	7	154	
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1820	1781	1585	
Q Serve(g_s), s	4.6	0.6	0.0	0.6	0.1	2.3	
Cycle Q Clear(g_c), s	4.6	0.6	0.0	0.6	0.1	2.3	
Prop In Lane	1.00			0.15	1.00	1.00	
Lane Grp Cap(c), veh/h	247	542	0	121	963	857	
V/C Ratio(X)	0.73	0.06	0.00	0.22	0.01	0.18	
Avail Cap(c_a), veh/h	340	1249	0	714	963	857	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	19.5	12.1	0.0	20.9	5.0	5.5	
Incr Delay (d2), s/veh	5.0	0.0	0.0	0.9	0.0	0.5	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	2.0	0.2	0.0	0.3	0.0	3.1	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	24.4	12.1	0.0	21.8	5.0	6.0	
LnGrp LOS	C	B	A	C	A	A	
Approach Vol, veh/h		211	26		161		
Approach Delay, s/veh		22.6	21.8		5.9		
Approach LOS		C	C		A		
Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			17.7		29.5	10.5	7.1
Change Period (Y+Rc), s			4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s			31.0		25.0	8.5	18.0
Max Q Clear Time (g_c+I1), s			2.6		4.3	6.6	2.6
Green Ext Time (p_c), s			0.1		0.4	0.1	0.1
Intersection Summary							
HCM 6th Ctrl Delay			15.8				
HCM 6th LOS			B				
Notes							

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Existing Plus Project AM Peak Hour








												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	232	0	283	924	763	0	0	656	419
Future Volume (veh/h)	0	0	0	232	0	283	924	763	0	0	656	419
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				273	0	174	1087	898	0	0	772	140
Peak Hour Factor				0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %				1	0	1	2	2	0	0	2	2
Cap, veh/h				609	0	279	1271	2411	0	0	1528	373
Arrive On Green				0.17	0.00	0.17	0.37	0.68	0.00	0.00	0.24	0.24
Sat Flow, veh/h				3483	0	1598	3456	3647	0	0	6696	1572
Grp Volume(v), veh/h				273	0	174	1087	898	0	0	772	140
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1728	1777	0	0	1609	1572
Q Serve(g_s), s				3.8	0.0	5.5	15.8	5.9	0.0	0.0	5.7	4.1
Cycle Q Clear(g_c), s				3.8	0.0	5.5	15.8	5.9	0.0	0.0	5.7	4.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				609	0	279	1271	2411	0	0	1528	373
V/C Ratio(X)				0.45	0.00	0.62	0.86	0.37	0.00	0.00	0.51	0.38
Avail Cap(c_a), veh/h				2746	0	1259	2851	5798	0	0	4718	1153
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				20.1	0.0	20.8	15.9	3.8	0.0	0.0	18.0	17.4
Incr Delay (d2), s/veh				0.2	0.0	0.8	0.7	0.0	0.0	0.0	0.1	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.3	0.0	1.8	4.9	0.8	0.0	0.0	1.8	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				20.3	0.0	21.7	16.6	3.8	0.0	0.0	18.1	17.6
LnGrp LOS				C	A	C	B	A	A	A	B	B
Approach Vol, veh/h					447			1985			912	
Approach Delay, s/veh					20.9			10.8			18.0	
Approach LOS					C			B			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		41.0			24.1	17.0		13.5				
Change Period (Y+Rc), s		5.3			4.0	5.3		5.3				
Max Green Setting (Gmax), s		87.7			45.0	38.7		41.7				
Max Q Clear Time (g_c+I1), s		7.9			17.8	7.7		7.5				
Green Ext Time (p_c), s		4.1			2.2	3.6		0.7				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				14.1								
HCM 6th LOS				B								

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Existing Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	349	0	552	0	0	0	0	1339	190	276	611	0
Future Volume (veh/h)	349	0	552	0	0	0	0	1339	190	276	611	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1885	1885	1870	1870	0
Adj Flow Rate, veh/h	406	0	642				0	1557	200	321	710	0
Peak Hour Factor	0.86	0.86	0.86				0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3				0	1	1	2	2	0
Cap, veh/h	1024	0	911				0	2346	301	436	2018	0
Arrive On Green	0.29	0.00	0.29				0.00	0.40	0.38	0.13	0.57	0.00
Sat Flow, veh/h	3534	0	3145				0	6124	752	3456	3647	0
Grp Volume(v), veh/h	406	0	642				0	1292	465	321	710	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1621	1748	1728	1777	0
Q Serve(g_s), s	6.0	0.0	11.9				0.0	14.2	14.3	5.8	7.0	0.0
Cycle Q Clear(g_c), s	6.0	0.0	11.9				0.0	14.2	14.3	5.8	7.0	0.0
Prop In Lane	1.00		1.00				0.00		0.43	1.00		0.00
Lane Grp Cap(c), veh/h	1024	0	911				0	1948	700	436	2018	0
V/C Ratio(X)	0.40	0.00	0.70				0.00	0.66	0.66	0.74	0.35	0.00
Avail Cap(c_a), veh/h	3738	0	3326				0	3131	1125	900	3431	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.6	0.0	20.7				0.0	16.0	16.2	27.5	7.6	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.0				0.0	0.1	0.4	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	3.9				0.0	4.3	4.8	2.2	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.8	0.0	21.7				0.0	16.1	16.6	28.4	7.7	0.0
LnGrp LOS	B	A	C				A	B	B	C	A	A
Approach Vol, veh/h	1048						1757			1031		
Approach Delay, s/veh	20.6						16.3			14.1		
Approach LOS	C						B			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), \$2.2	30.1		22.9		42.3							
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	7.0	40.7	68.5		* 63							
Max Q Clear Time (g_c+I1), s	17.8	16.3	13.9		9.0							
Green Ext Time (p_c), s	0.4	8.6	4.5		3.1							

### Intersection Summary

HCM 6th Ctrl Delay 16.9  
HCM 6th LOS B

### Notes

User approved volume balancing among the lanes for turning movement.
















\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Existing Plus Project AM Peak Hour

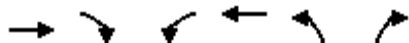


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	  		 	
Traffic Volume (veh/h)	23	2	81	427	79	104	231	462	903	26	593	31
Future Volume (veh/h)	23	2	81	427	79	104	231	462	903	26	593	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1841	1841	1841	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	27	2	0	502	93	66	272	544	376	31	698	31
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	8	8	4	4	4	2	2	2	5	5	5
Cap, veh/h	42	172	0	704	215	152	328	1424	1100	125	976	43
Arrive On Green	0.02	0.10	0.00	0.14	0.21	0.20	0.18	0.40	0.40	0.07	0.29	0.27
Sat Flow, veh/h	1697	1781	0	4944	1002	711	1781	3554	2745	1739	3383	150
Grp Volume(v), veh/h	27	2	0	502	0	159	272	544	376	31	358	371
Grp Sat Flow(s),veh/h/ln	1697	1781	0	1648	0	1713	1781	1777	1372	1739	1735	1799
Q Serve(g_s), s	0.9	0.1	0.0	5.4	0.0	4.5	8.2	6.0	5.3	0.9	10.3	10.3
Cycle Q Clear(g_c), s	0.9	0.1	0.0	5.4	0.0	4.5	8.2	6.0	5.3	0.9	10.3	10.3
Prop In Lane	1.00		0.00	1.00		0.42	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	42	172	0	704	0	367	328	1424	1100	125	501	519
V/C Ratio(X)	0.65	0.01	0.00	0.71	0.00	0.43	0.83	0.38	0.34	0.25	0.71	0.72
Avail Cap(c_a), veh/h	153	954	0	1069	0	1133	546	3094	2390	125	1104	1144
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.8	22.7	0.0	22.7	0.0	19.0	21.8	11.8	11.5	24.3	17.7	17.7
Incr Delay (d2), s/veh	6.2	0.0	0.0	0.5	0.0	0.3	2.1	0.1	0.1	0.4	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.8	0.0	1.5	3.1	1.8	1.2	0.4	3.4	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	22.7	0.0	23.2	0.0	19.3	23.9	11.8	11.6	24.7	18.4	18.4
LnGrp LOS	C	C	A	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h												
29												
661												
1192												
760												
Approach Delay, s/veh												
32.3												
22.3												
14.5												
18.7												
Approach LOS												
C												
C												
B												
B												
Timer - Assigned Phs												
1												
2												
3												
4												
5												
6												
7												
8												
Phs Duration (G+Y+Rc), s												
8.0												
26.2												
11.9												
9.4												
14.2												
20.0												
5.4												
15.9												
Change Period (Y+Rc), s												
4.0												
4.9												
4.0												
4.6												
4.0												
4.9												
4.0												
4.6												
Max Green Setting (Gmax), s												
4.0												
47.4												
12.0												
29.1												
17.0												
34.4												
5.0												
36.1												
Max Q Clear Time (g_c+12.5), s												
8.0												
8.0												
7.4												
2.1												
10.2												
12.3												
2.9												
6.5												
Green Ext Time (p_c), s												
0.0												
3.1												
0.5												
0.0												
0.2												
2.5												
0.0												
0.5												
Intersection Summary												
HCM 6th Ctrl Delay												
17.8												
HCM 6th LOS												
B												

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Existing Plus Project AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	234	697	55	283	327	160
Future Volume (veh/h)	234	697	55	283	327	160
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1366	1366	1856	1856
Adj Flow Rate, veh/h	252	231	59	304	352	34
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	36	36	3	3
Cap, veh/h	1038	457	214	716	620	284
Arrive On Green	0.29	0.29	0.08	0.52	0.18	0.18
Sat Flow, veh/h	3647	1566	2525	1366	3428	1572
Grp Volume(v), veh/h	252	231	59	304	352	34
Grp Sat Flow(s), veh/h/ln	1777	1566	1262	1366	1714	1572
Q Serve(g_s), s	1.5	3.3	0.6	3.7	2.5	0.5
Cycle Q Clear(g_c), s	1.5	3.3	0.6	3.7	2.5	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1038	457	214	716	620	284
V/C Ratio(X)	0.24	0.51	0.28	0.42	0.57	0.12
Avail Cap(c_a), veh/h	7078	3119	522	3206	2327	1067
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.3	8.0	11.6	3.9	10.1	9.3
Incr Delay (d2), s/veh	0.0	0.3	0.7	0.1	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	0.1	0.0	0.7	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.4	8.3	12.3	4.1	10.4	9.4
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	483			363	386	
Approach Delay, s/veh	7.8			5.4	10.3	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		8.9	6.3	11.9		18.2
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		18.4	5.1	53.4		63.0
Max Q Clear Time (g_c+I1), s		4.5	2.6	5.3		5.7
Green Ext Time (p_c), s		0.6	0.0	1.3		1.1
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			7.9			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Existing Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱		↰↱↰↱					↑↑↑↑		↰↱↰↱	↑↑↑↑	
Traffic Volume (veh/h)	173	0	809	0	0	0	5	1423	350	158	671	0
Future Volume (veh/h)	173	0	809	0	0	0	5	1423	350	158	671	0
Initial Q (Qb), veh	0	0	60				0	60	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870				1870	1870	1870	1826	1826	0
Adj Flow Rate, veh/h	197	0	268				6	1617	363	180	762	0
Peak Hour Factor	0.88	0.88	0.88				0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	0	2				2	2	2	5	5	0
Cap, veh/h	521	0	583				65	2581	485	275	3606	0
Arrive On Green	0.14	0.00	0.14				0.54	0.54	0.52	0.09	0.71	0.00
Sat Flow, veh/h	3456	0	3614				4	4406	986	3374	5149	0
Grp Volume(v), veh/h	197	0	268				686	752	548	180	762	0
Grp Sat Flow(s), veh/h/ln	1728	0	1205				1864	1021	1489	1687	1662	0
Q Serve(g_s), s	2.8	0.0	3.8				0.0	14.8	15.0	2.8	2.9	0.0
Cycle Q Clear(g_c), s	2.8	0.0	3.8				14.7	14.8	15.0	2.8	2.9	0.0
Prop In Lane	1.00		1.00				0.01		0.66	1.00		0.00
Lane Grp Cap(c), veh/h	521	0	583				1083	1139	828	275	3606	0
V/C Ratio(X)	0.38	0.00	0.46				0.63	0.66	0.66	0.66	0.21	0.00
Avail Cap(c_a), veh/h	1138	0	1190				2371	2541	1853	741	4286	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.4	0.0	37.5				10.5	11.5	10.8	31.1	3.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.2				0.2	0.2	0.3	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	141.3				3.8	14.7	7.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	11.5				7.4	6.8	6.9	1.4	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.5	0.0	179.1				14.5	26.4	18.1	32.1	3.0	0.0
LnGrp LOS	C	A	F				B	C	B	C	A	A
Approach Vol, veh/h		465						1986			942	
Approach Delay, s/veh		114.4						20.0			8.6	
Approach LOS		F						C			A	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	9.6	33.3		11.8		42.8						
Change Period (Y+Rc), s	4.9	* 4.9		5.3		4.9						
Max Green Setting (Gmax), s	2.0	* 67		16.7		46.1						
Max Q Clear Time (g_c+I4, s)	17.0			5.8		4.9						
Green Ext Time (p_c), s	0.2	11.3		0.8		3.4						

### Intersection Summary

HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Contra Loma Plaza/Davison Drive

The Ranch  
Existing Plus Project AM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	↰
Traffic Volume (veh/h)	27	22	20	182	32	233	21	1185	111	159	811	20
Future Volume (veh/h)	27	22	20	182	32	233	21	1185	111	159	811	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	25	0	207	36	14	24	1347	123	181	922	22
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	1	1	1	2	2	2	2	2	2
Cap, veh/h	62	50	98	275	289	245	38	1610	146	273	1938	46
Arrive On Green	0.06	0.06	0.00	0.15	0.15	0.15	0.02	0.49	0.48	0.08	0.55	0.54
Sat Flow, veh/h	1000	806	1572	1795	1885	1594	1781	3293	299	3456	3545	85
Grp Volume(v), veh/h	56	0	0	207	36	14	24	724	746	181	462	482
Grp Sat Flow(s), veh/h/ln	1806	0	1572	1795	1885	1594	1781	1777	1815	1728	1777	1853
Q Serve(g_s), s	2.2	0.0	0.0	8.2	1.2	0.6	1.0	26.0	26.4	3.8	11.8	11.8
Cycle Q Clear(g_c), s	2.2	0.0	0.0	8.2	1.2	0.6	1.0	26.0	26.4	3.8	11.8	11.8
Prop In Lane	0.55		1.00	1.00		1.00	1.00		0.16	1.00		0.05
Lane Grp Cap(c), veh/h	113	0	98	275	289	245	38	869	887	273	972	1013
V/C Ratio(X)	0.50	0.00	0.00	0.75	0.12	0.06	0.64	0.83	0.84	0.66	0.48	0.48
Avail Cap(c_a), veh/h	855	0	744	923	969	819	385	1802	1841	748	1802	1880
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.5	0.0	0.0	29.9	27.0	26.7	35.9	16.3	16.4	33.1	10.3	10.3
Incr Delay (d2), s/veh	1.3	0.0	0.0	1.6	0.1	0.0	6.6	0.8	0.8	1.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	3.3	0.5	0.2	0.5	8.7	9.0	1.6	4.1	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.8	0.0	0.0	31.5	27.1	26.8	42.5	17.1	17.3	34.1	10.4	10.4
LnGrp LOS	C	A	A	C	C	C	D	B	B	C	B	B
Approach Vol, veh/h	56			257			1494			1125		
Approach Delay, s/veh	34.8			30.6			17.6			14.2		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.8	40.1		8.6	5.6	44.4		15.3				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+15), s	15.8	28.4		4.2	3.0	13.8		10.2				
Green Ext Time (p_c), s	0.2	7.2		0.1	0.0	4.4		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				17.8								
HCM 6th LOS				B								

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Existing Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	117	70	39	127	621	64	668	13	448	838	125
Future Volume (veh/h)	142	117	70	39	127	621	64	668	13	448	838	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	160	131	18	44	143	698	72	751	14	503	942	70
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	2	2	2
Cap, veh/h	197	1046	141	56	907	1186	153	964	18	607	1219	694
Arrive On Green	0.11	0.33	0.33	0.03	0.25	0.25	0.09	0.27	0.25	0.18	0.34	0.33
Sat Flow, veh/h	1781	3139	423	1795	3582	2812	1795	3596	67	3456	3554	1582
Grp Volume(v), veh/h	160	73	76	44	143	698	72	374	391	503	942	70
Grp Sat Flow(s),veh/h/ln	1781	1777	1786	1795	1791	1406	1795	1791	1872	1728	1777	1582
Q Serve(g_s), s	7.3	2.4	2.5	2.0	2.6	15.9	3.2	16.1	16.1	11.7	19.7	1.2
Cycle Q Clear(g_c), s	7.3	2.4	2.5	2.0	2.6	15.9	3.2	16.1	16.1	11.7	19.7	1.2
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	197	592	595	56	907	1186	153	480	502	607	1219	694
V/C Ratio(X)	0.81	0.12	0.13	0.79	0.16	0.59	0.47	0.78	0.78	0.83	0.77	0.10
Avail Cap(c_a), veh/h	492	1578	1586	215	2622	2532	237	1032	1078	1327	2942	1461
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.2	19.3	19.4	40.1	24.2	18.5	36.3	28.2	28.2	33.1	24.5	4.9
Incr Delay (d2), s/veh	3.0	0.0	0.0	9.0	0.0	0.2	0.8	1.0	1.0	1.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.9	0.9	1.0	1.0	4.6	1.4	6.5	6.7	4.9	8.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.2	19.4	19.4	49.1	24.2	18.7	37.2	29.3	29.2	34.3	24.9	4.9
LnGrp LOS	D	B	B	D	C	B	D	C	C	C	C	A
Approach Vol, veh/h	309			885			837			1515		
Approach Delay, s/veh	29.7			21.1			29.9			27.1		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.3	6.6	31.8	12.4	32.6	13.2	25.1					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	32.0	46.7	10.0	73.4	11.0	* 68	23.0	60.4				
Max Q Clear Time (g_c+I1), s	13.7	18.1	4.0	4.5	5.2	21.7	9.3	17.9				
Green Ext Time (p_c), s	0.9	2.7	0.0	0.5	0.0	5.4	0.2	2.1				

### Intersection Summary

HCM 6th Ctrl Delay	26.5
HCM 6th LOS	C

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Existing Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	59	580	7	95	55	756	1173	13	66	751	145
Future Volume (veh/h)	159	59	580	7	95	55	756	1173	13	66	751	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	110	131	81	7	96	8	764	1185	6	67	759	126
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	2	2	2
Cap, veh/h	213	224	380	11	150	134	907	1784	778	85	1209	199
Arrive On Green	0.12	0.12	0.12	0.09	0.09	0.09	0.26	0.50	0.50	0.05	0.27	0.27
Sat Flow, veh/h	1795	1885	3195	127	1737	1551	3483	3582	1561	1781	4402	724
Grp Volume(v), veh/h	110	131	81	103	0	8	764	1185	6	67	585	300
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1864	0	1551	1742	1791	1561	1781	1702	1722
Q Serve(g_s), s	3.7	4.2	1.5	3.4	0.0	0.3	13.4	16.0	0.1	2.4	9.7	9.9
Cycle Q Clear(g_c), s	3.7	4.2	1.5	3.4	0.0	0.3	13.4	16.0	0.1	2.4	9.7	9.9
Prop In Lane	1.00		1.00	0.07		1.00	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	213	224	380	161	0	134	907	1784	778	85	935	473
V/C Ratio(X)	0.52	0.58	0.21	0.64	0.00	0.06	0.84	0.66	0.01	0.78	0.63	0.63
Avail Cap(c_a), veh/h	502	527	894	1130	0	940	1786	3117	1359	304	1799	910
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.6	26.8	25.6	28.4	0.0	27.0	22.5	12.1	8.1	30.3	20.4	20.6
Incr Delay (d2), s/veh	0.7	0.9	0.1	1.6	0.0	0.1	0.8	0.2	0.0	5.8	0.3	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.8	0.5	1.5	0.0	0.1	4.8	4.8	0.0	1.1	3.6	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	27.3	27.8	25.7	30.0	0.0	27.1	23.4	12.3	8.1	36.1	20.7	21.1
LnGrp LOS	C	C	C	C	A	C	C	B	A	D	C	C
Approach Vol, veh/h	322			111			1955			952		
Approach Delay, s/veh	27.1			29.8			16.6			21.9		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.1	36.0		11.6	20.8	22.4		9.6				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	1.0	54.7		17.1	33.0	* 33		39.0				
Max Q Clear Time (g_c+14.4), s	14.4	18.0		6.2	15.4	11.9		5.4				
Green Ext Time (p_c), s	0.0	5.9		0.5	1.4	4.1		0.3				

### Intersection Summary

HCM 6th Ctrl Delay 19.6

HCM 6th LOS B

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Existing Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↑↑ ↱			↰ ↑↑ ↱			↰ ↱	↑	↰ ↱	↰ ↱	↱	
Traffic Volume (veh/h)	46	720	251	187	959	69	432	139	174	62	174	111
Future Volume (veh/h)	46	720	251	187	959	69	432	139	174	62	174	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	53	828	173	215	1102	24	497	160	51	71	200	108
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	68	1078	224	251	1840	40	574	728	602	92	311	168
Arrive On Green	0.04	0.25	0.25	0.14	0.36	0.35	0.16	0.39	0.39	0.05	0.27	0.26
Sat Flow, veh/h	1795	4256	883	1795	5180	113	3483	1885	1560	1810	1143	617
Grp Volume(v), veh/h	53	666	335	215	730	396	497	160	51	71	0	308
Grp Sat Flow(s),veh/h/ln	1795	1716	1708	1795	1716	1862	1742	1885	1560	1810	0	1761
Q Serve(g_s), s	2.8	16.9	17.1	11.0	16.4	16.4	13.1	5.4	2.0	3.6	0.0	14.6
Cycle Q Clear(g_c), s	2.8	16.9	17.1	11.0	16.4	16.4	13.1	5.4	2.0	3.6	0.0	14.6
Prop In Lane	1.00		0.52	1.00		0.06	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	68	869	433	251	1219	661	574	728	602	92	0	479
V/C Ratio(X)	0.78	0.77	0.77	0.86	0.60	0.60	0.87	0.22	0.08	0.77	0.00	0.64
Avail Cap(c_a), veh/h	172	1509	751	458	2056	1115	703	953	789	211	0	741
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.9	32.6	32.7	39.6	24.9	24.9	38.3	19.4	18.3	44.1	0.0	30.5
Incr Delay (d2), s/veh	6.9	0.5	1.1	3.2	0.2	0.3	8.2	0.1	0.0	5.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	6.7	6.8	4.8	6.2	6.8	5.9	2.2	0.7	1.7	0.0	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.8	33.1	33.8	42.8	25.0	25.2	46.5	19.4	18.4	49.2	0.0	31.0
LnGrp LOS	D	C	C	D	C	C	D	B	B	D	A	C
Approach Vol, veh/h	1054		1341			708			379			
Approach Delay, s/veh	34.3		27.9			38.4			34.4			
Approach LOS	C		C			D			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	40.3	17.2	27.8	19.5	29.6	7.6	37.4					
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	46.3	24.0	* 41	19.0	38.3	9.0	* 56					
Max Q Clear Time (g_c+15), s	7.4	13.0	19.1	15.1	16.6	4.8	18.4					
Green Ext Time (p_c), s	0.0	0.6	0.2	4.0	0.4	1.0	0.0	4.8				

### Intersection Summary

HCM 6th Ctrl Delay 32.7  
HCM 6th LOS C



























### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Existing Plus Project AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	27	616	256	250	644	215	385	308	187	297	532	20
Future Volume (veh/h)	27	616	256	250	644	215	385	308	187	297	532	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	31	716	45	291	749	86	448	358	126	345	619	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	41	1276	80	324	1938	221	517	741	256	418	908	31
Arrive On Green	0.02	0.26	0.25	0.18	0.42	0.41	0.15	0.29	0.27	0.12	0.26	0.24
Sat Flow, veh/h	1795	4931	308	1781	4641	529	3483	2593	897	3483	3530	120
Grp Volume(v), veh/h	31	497	264	291	548	287	448	245	239	345	314	326
Grp Sat Flow(s),veh/h/ln	1795	1716	1807	1781	1702	1766	1742	1791	1698	1742	1791	1859
Q Serve(g_s), s	1.8	13.0	13.2	16.6	11.6	11.8	13.1	11.8	12.2	10.1	16.4	16.4
Cycle Q Clear(g_c), s	1.8	13.0	13.2	16.6	11.6	11.8	13.1	11.8	12.2	10.1	16.4	16.4
Prop In Lane	1.00		0.17	1.00		0.30	1.00		0.53	1.00		0.06
Lane Grp Cap(c), veh/h	41	888	468	324	1421	738	517	512	485	418	460	478
V/C Ratio(X)	0.76	0.56	0.57	0.90	0.39	0.39	0.87	0.48	0.49	0.83	0.68	0.68
Avail Cap(c_a), veh/h	104	1255	661	463	1933	1003	637	672	637	670	689	716
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.5	33.4	33.5	41.6	21.0	21.2	43.2	30.7	31.2	44.7	34.8	34.8
Incr Delay (d2), s/veh	10.2	0.2	0.4	12.4	0.1	0.1	8.9	0.3	0.3	2.1	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	5.2	5.6	8.1	4.3	4.6	6.0	4.9	4.8	4.3	6.9	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.6	33.6	33.9	54.0	21.1	21.3	52.1	31.0	31.4	46.8	35.4	35.5
LnGrp LOS	E	C	C	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		792			1126			932			985	
Approach Delay, s/veh		34.8			29.6			41.3			39.4	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.5	33.7	22.9	30.9	19.4	30.7	6.4	47.4				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+I1), s	12.1	14.2	18.6	15.2	15.1	18.4	3.8	13.8				
Green Ext Time (p_c), s	0.4	1.6	0.3	2.8	0.4	2.1	0.0	3.4				
Intersection Summary												
HCM 6th Ctrl Delay			36.0									
HCM 6th LOS			D									

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Existing Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱ ↲ ↳			↰ ↱ ↲ ↳			↰ ↱ ↲ ↳			↰ ↱ ↲ ↳		
Traffic Volume (veh/h)	154	593	7	33	852	146	36	63	29	310	80	194
Future Volume (veh/h)	154	593	7	33	852	146	36	63	29	310	80	194
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	173	666	2	37	957	42	40	71	12	348	90	67
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	204	2142	6	57	1659	513	60	376	62	465	795	348
Arrive On Green	0.11	0.41	0.38	0.03	0.32	0.32	0.03	0.12	0.10	0.13	0.22	0.22
Sat Flow, veh/h	1781	5256	16	1781	5106	1578	1795	3076	507	3483	3582	1567
Grp Volume(v), veh/h	173	431	237	37	957	42	40	41	42	348	90	67
Grp Sat Flow(s),veh/h/ln	1781	1702	1867	1781	1702	1578	1795	1791	1792	1742	1791	1567
Q Serve(g_s), s	5.0	4.5	4.5	1.1	8.2	1.0	1.2	1.1	1.1	5.0	1.1	1.8
Cycle Q Clear(g_c), s	5.0	4.5	4.5	1.1	8.2	1.0	1.2	1.1	1.1	5.0	1.1	1.8
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	204	1387	761	57	1659	513	60	219	219	465	795	348
V/C Ratio(X)	0.85	0.31	0.31	0.65	0.58	0.08	0.66	0.19	0.19	0.75	0.11	0.19
Avail Cap(c_a), veh/h	204	3004	1648	204	4506	1392	205	1526	1527	465	3120	1365
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.8	10.5	10.5	25.1	14.7	12.3	25.1	20.7	20.9	21.9	16.3	16.6
Incr Delay (d2), s/veh	26.0	0.0	0.1	4.7	0.1	0.0	4.5	0.2	0.2	5.9	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	1.3	1.4	0.5	2.5	0.3	0.5	0.4	0.4	2.1	0.4	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.8	10.6	10.6	29.8	14.8	12.3	29.6	20.8	21.0	27.8	16.3	16.7
LnGrp LOS	D	B	B	C	B	B	C	C	C	C	B	B
Approach Vol, veh/h	841		1036				123			505		
Approach Delay, s/veh	18.5		15.3				23.7			24.3		
Approach LOS	B		B				C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.4	10.4	5.7	25.4	5.8	15.6	10.0	21.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	43.4	6.0	45.0	6.0	44.4	6.0	45.0				
Max Q Clear Time (g_c+11), s	3.1	3.1	3.1	6.5	3.2	3.8	7.0	10.2				
Green Ext Time (p_c), s	0.0	0.2	0.0	2.5	0.0	0.4	0.0	4.5				

### Intersection Summary

HCM 6th Ctrl Delay	18.6
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Existing Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1020	500	111	1240	0	0	0	0	350	2	570
Future Volume (veh/h)	0	1020	500	111	1240	0	0	0	0	350	2	570
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1109	142	121	1348	0				381	0	591
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	1	1	0				2	2	2
Cap, veh/h	0	1644	510	162	2371	0				1498	0	666
Arrive On Green	0.00	0.32	0.32	0.08	0.46	0.00				0.42	0.00	0.42
Sat Flow, veh/h	0	5316	1596	1975	5316	0				3563	0	1585
Grp Volume(v), veh/h	0	1109	142	121	1348	0				381	0	591
Grp Sat Flow(s),veh/h/ln	0	1716	1596	987	1716	0				1781	0	1585
Q Serve(g_s), s	0.0	12.6	4.5	4.0	12.9	0.0				4.7	0.0	23.2
Cycle Q Clear(g_c), s	0.0	12.6	4.5	4.0	12.9	0.0				4.7	0.0	23.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1644	510	162	2371	0				1498	0	666
V/C Ratio(X)	0.00	0.67	0.28	0.75	0.57	0.00				0.25	0.00	0.89
Avail Cap(c_a), veh/h	0	3516	1090	469	5045	0				3492	0	1554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.9	17.1	30.2	13.3	0.0				12.7	0.0	18.0
Incr Delay (d2), s/veh	0.0	0.2	0.1	2.6	0.1	0.0				0.0	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.3	1.4	0.9	4.0	0.0				1.6	0.0	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	20.1	17.2	32.8	13.3	0.0				12.7	0.0	19.7
LnGrp LOS	A	C	B	C	B	A				B	A	B
Approach Vol, veh/h		1251			1469						972	
Approach Delay, s/veh		19.7			14.9						16.9	
Approach LOS		B			B						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.5	25.5		32.3		35.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	6.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+10), s	10.0	14.6		25.2		14.9						
Green Ext Time (p_c), s	0.1	5.5		1.8		7.1						

## Intersection Summary

HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B

## Notes

User approved volume balancing among the lanes for turning movement.



# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Existing Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1013	357	36	832	451	519	24	176	0	0	0
Future Volume (veh/h)	0	1013	357	36	832	451	519	24	176	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	0	1101	128	39	904	229	583	0	51			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2			
Cap, veh/h	0	2079	644	63	2765	834	926	0	412			
Arrive On Green	0.00	0.41	0.41	0.04	0.54	0.54	0.26	0.00	0.26			
Sat Flow, veh/h	0	5274	1583	1781	5106	1541	3563	0	1583			
Grp Volume(v), veh/h	0	1101	128	39	904	229	583	0	51			
Grp Sat Flow(s),veh/h/ln	0	1702	1583	1781	1702	1541	1781	0	1583			
Q Serve(g_s), s	0.0	6.6	2.1	0.9	4.0	3.2	5.8	0.0	1.0			
Cycle Q Clear(g_c), s	0.0	6.6	2.1	0.9	4.0	3.2	5.8	0.0	1.0			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2079	644	63	2765	834	926	0	412			
V/C Ratio(X)	0.00	0.53	0.20	0.62	0.33	0.27	0.63	0.00	0.12			
Avail Cap(c_a), veh/h	0	6083	1885	486	7984	2409	4332	0	1925			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	9.0	7.7	19.2	5.1	5.0	13.2	0.0	11.4			
Incr Delay (d2), s/veh	0.0	0.1	0.1	3.7	0.0	0.1	0.3	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	1.5	0.4	0.4	0.6	0.4	1.7	0.0	0.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	9.1	7.8	22.9	5.2	5.0	13.5	0.0	11.4			
LnGrp LOS	A	A	A	C	A	A	B	A	B			
Approach Vol, veh/h	1229			1172			634					
Approach Delay, s/veh	9.0			5.7			13.3					
Approach LOS	A			A			B					
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.4	20.4		14.5		25.8						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	1.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+I), s	12.5	8.6		7.8		6.0						
Green Ext Time (p_c), s	0.0	5.5		1.1		4.6						

### Intersection Summary

HCM 6th Ctrl Delay	8.6
HCM 6th LOS	A

### Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Existing Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	86	7	13	58	327	7	277	23	241	166	22
Future Volume (veh/h)	39	86	7	13	58	327	7	277	23	241	166	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	46	102	6	15	69	210	8	330	20	287	198	18
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	127	431	25	126	97	296	128	695	42	349	1082	97
Arrive On Green	0.07	0.25	0.25	0.07	0.25	0.25	0.07	0.20	0.18	0.19	0.33	0.30
Sat Flow, veh/h	1781	1747	103	1767	395	1201	1795	3422	206	1795	3318	299
Grp Volume(v), veh/h	46	0	108	15	0	279	8	172	178	287	106	110
Grp Sat Flow(s),veh/h/ln	1781	0	1850	1767	0	1596	1795	1791	1838	1795	1791	1826
Q Serve(g_s), s	1.4	0.0	2.6	0.4	0.0	9.0	0.2	4.8	4.8	8.6	2.4	2.4
Cycle Q Clear(g_c), s	1.4	0.0	2.6	0.4	0.0	9.0	0.2	4.8	4.8	8.6	2.4	2.4
Prop In Lane	1.00		0.06	1.00		0.75	1.00		0.11	1.00		0.16
Lane Grp Cap(c), veh/h	127	0	456	126	0	394	128	364	373	349	584	595
V/C Ratio(X)	0.36	0.00	0.24	0.12	0.00	0.71	0.06	0.47	0.48	0.82	0.18	0.18
Avail Cap(c_a), veh/h	349	0	1186	346	0	1023	671	1626	1669	671	1626	1658
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	0.0	16.9	24.4	0.0	19.3	24.3	19.7	19.8	21.7	13.6	13.7
Incr Delay (d2), s/veh	0.6	0.0	0.1	0.2	0.0	0.9	0.1	0.4	0.4	1.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	1.0	0.2	0.0	2.9	0.1	1.7	1.8	3.3	0.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.5	0.0	17.0	24.6	0.0	20.2	24.4	20.1	20.2	23.6	13.6	13.7
LnGrp LOS	C	A	B	C	A	C	C	C	C	C	B	B
Approach Vol, veh/h	154					294		358		503		
Approach Delay, s/veh	19.6					20.4		20.2		19.3		
Approach LOS	B					C		C		B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.9	15.4	8.0	17.9	8.0	22.3	8.0	17.9				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	11.0	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+I10), s	11.0	6.8	2.4	4.6	2.2	4.4	3.4	11.0				
Green Ext Time (p_c), s	0.3	1.1	0.0	0.3	0.0	0.7	0.0	1.0				

## Intersection Summary

HCM 6th Ctrl Delay 19.8









HCM 6th LOS B

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Existing Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	173	174	226	162	125	92	683	135	84	889	59
Future Volume (veh/h)	118	173	174	226	162	125	92	683	135	84	889	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	130	190	156	248	178	111	101	751	137	92	977	61
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	164	220	180	287	322	201	129	1059	193	119	1177	73
Arrive On Green	0.09	0.23	0.23	0.16	0.30	0.30	0.07	0.35	0.33	0.07	0.34	0.33
Sat Flow, veh/h	1795	950	780	1781	1068	666	1795	3023	551	1795	3418	213
Grp Volume(v), veh/h	130	0	346	248	0	289	101	445	443	92	512	526
Grp Sat Flow(s),veh/h/ln	1795	0	1731	1781	0	1734	1795	1791	1783	1795	1791	1840
Q Serve(g_s), s	5.9	0.0	16.1	11.4	0.0	11.7	4.6	18.0	18.0	4.2	22.0	22.0
Cycle Q Clear(g_c), s	5.9	0.0	16.1	11.4	0.0	11.7	4.6	18.0	18.0	4.2	22.0	22.0
Prop In Lane	1.00		0.45	1.00		0.38	1.00		0.31	1.00		0.12
Lane Grp Cap(c), veh/h	164	0	400	287	0	523	129	627	625	119	617	634
V/C Ratio(X)	0.79	0.00	0.86	0.86	0.00	0.55	0.78	0.71	0.71	0.78	0.83	0.83
Avail Cap(c_a), veh/h	322	0	703	426	0	808	193	813	810	257	877	901
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	0.0	30.9	34.2	0.0	24.5	38.2	23.5	23.7	38.5	25.2	25.3
Incr Delay (d2), s/veh	3.3	0.0	2.2	8.1	0.0	0.3	5.8	1.2	1.2	4.1	3.2	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	6.4	5.2	0.0	4.4	2.1	7.0	7.1	1.9	8.9	9.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	0.0	33.2	42.3	0.0	24.9	44.0	24.7	24.9	42.5	28.4	28.4
LnGrp LOS	D	A	C	D	A	C	D	C	C	D	C	C
Approach Vol, veh/h	476				537				989		1130	
Approach Delay, s/veh	35.2				32.9				26.7		29.5	
Approach LOS	D				C				C		C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	33.3	17.5	23.3	10.0	32.8	11.6	29.2				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	2.0	36.7	20.0	34.0	9.0	39.7	15.0	39.0				
Max Q Clear Time (g_c+16.2), s	2.0	20.0	13.4	18.1	6.6	24.0	7.9	13.7				
Green Ext Time (p_c), s	0.0	3.0	0.2	1.1	0.0	3.5	0.1	1.0				

### Intersection Summary











HCM 6th Ctrl Delay	30.1
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Existing Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	0	41	8	0	57	10	770	41	300	942	68
Future Volume (veh/h)	123	0	41	8	0	57	10	770	41	300	942	68
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	0	1900	1870	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	134	0	5	9	0	0	11	885	13	345	1083	71
Peak Hour Factor	0.92	0.92	0.92	0.87	0.92	0.87	0.92	0.87	0.87	0.87	0.87	0.92
Percent Heavy Veh, %	2	2	2	0	0	0	2	1	1	1	1	1
Cap, veh/h	190	0	147	39	0	0	42	1257	546	410	1895	124
Arrive On Green	0.11	0.00	0.08	0.02	0.00	0.00	0.02	0.35	0.35	0.23	0.56	0.53
Sat Flow, veh/h	1781	0	1585	1810	9		1781	3582	1555	1795	3412	224
Grp Volume(v), veh/h	134	0	5	9	28.1		11	885	13	345	568	586
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1810	C		1781	1791	1555	1795	1791	1845
Q Serve(g_s), s	3.8	0.0	0.2	0.3			0.3	11.1	0.3	9.6	10.8	10.8
Cycle Q Clear(g_c), s	3.8	0.0	0.2	0.3			0.3	11.1	0.3	9.6	10.8	10.8
Prop In Lane	1.00		1.00	1.00			1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	190	0	147	39			42	1257	546	410	995	1025
V/C Ratio(X)	0.70	0.00	0.03	0.23			0.26	0.70	0.02	0.84	0.57	0.57
Avail Cap(c_a), veh/h	376	0	1201	191			188	2336	1014	861	1838	1893
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.5	0.0	21.8	25.1			25.0	14.6	11.1	19.2	7.5	7.6
Incr Delay (d2), s/veh	4.7	0.0	0.1	3.0			3.2	0.3	0.0	1.8	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.1	0.1			0.2	3.5	0.1	3.5	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.2	0.0	21.8	28.1			28.2	14.9	11.1	21.1	7.7	7.8
LnGrp LOS	C	A	C	C			C	B	B	C	A	A
Approach Vol, veh/h	139						909			1499		
Approach Delay, s/veh	27.0						15.0			10.8		
Approach LOS	C						B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7					
Phs Duration (G+Y+Rc), s	5.9	22.3	5.1	8.8	5.2	33.0	9.6					
Change Period (Y+Rc), s	4.0	5.3	4.5	4.5	4.5	5.3	4.5					
Max Green Setting (Gmax), s	25.0	32.7	5.0	39.0	5.0	52.2	10.5					
Max Q Clear Time (g_c+I1), s	11.6	13.1	2.3	2.2	2.3	12.8	5.8					
Green Ext Time (p_c), s	0.4	3.7	0.0	0.0	0.0	4.8	0.1					

### Intersection Summary










HCM 6th Ctrl Delay	13.2
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Existing Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	0	69	32	0	309	33	350	37	370	496	18
Future Volume (veh/h)	111	0	69	32	0	309	33	350	37	370	496	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	137	0	0	40	0	0	41	432	37	457	612	20
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	212	5	4	107	5	0	68	820	70	552	1820	59
Arrive On Green	0.12	0.00	0.00	0.06	0.00	0.00	0.04	0.24	0.21	0.31	0.51	0.48
Sat Flow, veh/h	1810	1900	1610	1795	1885	0	1810	3359	286	1795	3540	116
Grp Volume(v), veh/h	137	0	0	40	0	0	41	231	238	457	309	323
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1795	1885	0	1810	1805	1841	1795	1791	1864
Q Serve(g_s), s	2.6	0.0	0.0	0.8	0.0	0.0	0.8	4.0	4.1	8.6	3.7	3.7
Cycle Q Clear(g_c), s	2.6	0.0	0.0	0.8	0.0	0.0	0.8	4.0	4.1	8.6	3.7	3.7
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.16	1.00		0.06
Lane Grp Cap(c), veh/h	212	5	4	107	5	0	68	441	449	552	921	959
V/C Ratio(X)	0.65	0.00	0.00	0.37	0.00	0.00	0.61	0.52	0.53	0.83	0.34	0.34
Avail Cap(c_a), veh/h	505	2005	1699	342	1822	0	300	1391	1419	1537	2617	2724
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.3	0.0	0.0	16.4	0.0	0.0	17.2	11.9	12.0	11.7	5.2	5.2
Incr Delay (d2), s/veh	3.3	0.0	0.0	2.2	0.0	0.0	3.2	0.4	0.4	1.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.3	0.0	0.0	0.3	1.1	1.1	2.7	0.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	0.0	0.0	18.5	0.0	0.0	20.4	12.2	12.3	12.9	5.2	5.3
LnGrp LOS	B	A	A	B	A	A	C	B	B	B	A	A
Approach Vol, veh/h	137			40			510			1089		
Approach Delay, s/veh	18.6			18.5			12.9			8.5		
Approach LOS	B			B			B			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), \$5.1	12.8	6.2	2.1	5.4	22.6	8.2	0.0					
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0				
Max Green Setting (Gmax), s	11.0	26.6	6.4	38.2	6.0	51.6	9.6	35.0				
Max Q Clear Time (g_c+I10), s	10.6	6.1	2.8	0.0	2.8	5.7	4.6	0.0				
Green Ext Time (p_c), s	0.7	1.5	0.0	0.0	0.0	2.7	0.1	0.0				

### Intersection Summary

HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Existing Plus Project AM Peak Hour

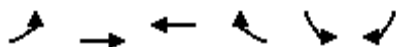







Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑		↰	↑↑		↰	↑↑		↰	↑↑	
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	7	0	4	7	0	4	3254	0	4	3254	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3647	0	1781	3647	0	1781	3647	0
Grp Volume(v), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	0	1781	1777	0	1781	1777	0
Q Serve(g_s), 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
Cycle Q Clear(g_c), 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
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	4	7	0	4	7	0	4	3254	0	4	3254	0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	581	3329	0	581	3329	0	581	3254	0	581	3254	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h	0		0				0		0			
Approach Delay, s/veh	0.0		0.0				0.0		0.0			
Approach LOS												
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	0.0	47.5	0.0	0.0	0.0	47.5	0.0	0.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	43.0	43.0	15.0	44.0	15.0	43.0	15.0	44.0				
Max Q Clear Time (g_c+I10), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			0.0									
HCM 6th LOS			A									

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

The Ranch  
Existing Plus Project AM Peak Hour



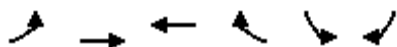
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	4	8	8	0	1625	1446
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	7294	0	1781	1585
Grp Volume(v), veh/h	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	0	1781	1585
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	4	8	8	0	1625	1446
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	1224	6205	3453	0	1625	1446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		0	0		0	
Approach Delay, s/veh		0.0	0.0		0.0	
Approach LOS						
Timer - Assigned Phs			4		6	7 8
Phs Duration (G+Y+Rc), s			0.0		45.7	0.0 0.0
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			79.3		41.2	30.9 43.9
Max Q Clear Time (g_c+I1), s			0.0		0.0	0.0 0.0
Green Ext Time (p_c), s			0.0		0.0	0.0 0.0
Intersection Summary						
HCM 6th Ctrl Delay			0.0			
HCM 6th LOS			A			



# HCM 6th Signalized Intersection Summary

## 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Existing Plus Project AM Peak Hour










Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1	0	314	787	1
Future Volume (veh/h)	0	1	0	314	787	1
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	0	1	0	20	926	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	395	173	173	146	1634	749
Arrive On Green	0.00	0.09	0.00	0.09	0.47	0.00
Sat Flow, veh/h	1392	1870	1870	1585	3483	1598
Grp Volume(v), veh/h	0	1	0	20	926	0
Grp Sat Flow(s), veh/h/ln	1392	1870	1870	1585	1742	1598
Q Serve(g_s), s	0.0	0.0	0.0	0.2	3.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.2	3.5	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	395	173	173	146	1634	749
V/C Ratio(X)	0.00	0.01	0.00	0.14	0.57	0.00
Avail Cap(c_a), veh/h	4539	5741	5741	4866	6873	3153
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	7.5	0.0	7.6	3.5	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	7.5	0.0	7.8	3.6	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		1	20		926	
Approach Delay, s/veh		7.5	7.8		3.6	
Approach LOS		A	A		A	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		5.7			5.7	12.6
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		54.7			54.7	34.7
Max Q Clear Time (g_c+I1), s		2.0			2.2	5.5
Green Ext Time (p_c), s		0.0			0.0	1.8
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			3.7			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Existing Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	818	0	0	247	961	16	3	136	0	0	0
Future Volume (veh/h)	6	818	0	0	247	961	16	3	136	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	6	843	0	0	255	522	18	0	13			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	23	2830	0	0	685	1161	318	0	141			
Arrive On Green	0.01	0.55	0.00	0.00	0.36	0.36	0.09	0.00	0.09			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	6	843	0	0	255	522	18	0	13			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	0.0	2.0	0.0	0.0	2.2	2.8	0.1	0.0	0.2			
Cycle Q Clear(g_c), s	0.0	2.0	0.0	0.0	2.2	2.8	0.1	0.0	0.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	23	2830	0	0	685	1161	318	0	141			
V/C Ratio(X)	0.26	0.30	0.00	0.00	0.37	0.45	0.06	0.00	0.09			
Avail Cap(c_a), veh/h	2509	17380	0	0	4668	7913	7479	0	3328			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	11.0	2.7	0.0	0.0	5.2	5.4	9.2	0.0	9.3			
Incr Delay (d2), s/veh	2.2	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	2.7	0.0	0.0	5.3	5.5	9.3	0.0	9.4			
LnGrp LOS	B	A	A	A	A	A	A	A	A			
Approach Vol, veh/h	849				777				31			
Approach Delay, s/veh	2.8				5.4				9.3			
Approach LOS	A				A				A			
Timer - Assigned Phs	2		4		5	6						
Phs Duration (G+Y+Rc), s	16.2		6.0		4.1	12.1						
Change Period (Y+Rc), s	5.3		5.3		4.0	5.3						
Max Green Setting (Gmax), s	73.7		45.7		16.0	53.7						
Max Q Clear Time (g_c+I1), s	4.0		2.2		2.0	4.8						
Green Ext Time (p_c), s	3.8		0.0		0.0	2.0						

### Intersection Summary




HCM 6th Ctrl Delay	4.1
HCM 6th LOS	A

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Existing Plus Project AM Peak Hour

Intersection						
Int Delay, s/veh	26.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	79	382	27	30	473	48
Future Vol, veh/h	79	382	27	30	473	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	84	406	29	32	503	51
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1102	45	0	0	61	0
Stage 1	45	-	-	-	-	-
Stage 2	1057	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	236	1031	-	-	1555	-
Stage 1	983	-	-	-	-	-
Stage 2	337	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	157	1031	-	-	1555	-
Mov Cap-2 Maneuver	157	-	-	-	-	-
Stage 1	983	-	-	-	-	-
Stage 2	225	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	51.5	0		7.6		
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 528		1555	-	
HCM Lane V/C Ratio	-	- 0.929		0.324	-	
HCM Control Delay (s)	-	- 51.5		8.4	0	
HCM Lane LOS	-	- F		A	A	
HCM 95th %tile Q(veh)	-	- 11.4		1.4	-	

# HCM 6th Signalized Intersection Summary 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Existing Plus Project AM Peak Hour



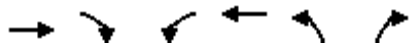
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↰↰↰	↱	↰	↰↰	
Traffic Volume (veh/h)	268	1209	739	77	349	746	
Future Volume (veh/h)	268	1209	739	77	349	746	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1870	1870	1796	1796	
Adj Flow Rate, veh/h	291	1314	803	0	379	496	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	1	1	2	2	7	7	
Cap, veh/h	348	1471	1395		880	1378	
Arrive On Green	0.10	0.41	0.27	0.00	0.51	0.51	
Sat Flow, veh/h	3483	3676	5274	1585	1711	2679	
Grp Volume(v), veh/h	291	1314	803	0	379	496	
Grp Sat Flow(s),veh/h/ln	1742	1791	1702	1585	1711	1340	
Q Serve(g_s), s	9.8	41.0	16.3	0.0	16.6	13.2	
Cycle Q Clear(g_c), s	9.8	41.0	16.3	0.0	16.6	13.2	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	348	1471	1395		880	1378	
V/C Ratio(X)	0.84	0.89	0.58		0.43	0.36	
Avail Cap(c_a), veh/h	421	1955	1979		880	1378	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	53.0	32.9	37.6	0.0	18.2	17.4	
Incr Delay (d2), s/veh	10.0	3.8	0.1	0.0	0.1	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	4.7	17.5	6.6	0.0	6.5	12.3	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	63.0	36.7	37.8	0.0	18.3	17.4	
LnGrp LOS	E	D	D		B	B	
Approach Vol, veh/h		1605	803	A	875		
Approach Delay, s/veh		41.5	37.8		17.8		
Approach LOS		D	D		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				53.8	66.2	16.5	37.3
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				65.5	45.5	14.5	46.5
Max Q Clear Time (g_c+I1), s				43.0	18.6	11.8	18.3
Green Ext Time (p_c), s				6.3	1.8	0.2	3.5
Intersection Summary							
HCM 6th Ctrl Delay			34.3				
HCM 6th LOS			C				

## Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Existing Plus Project AM Peak Hour

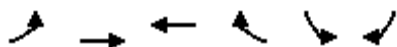


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	973	584	0	1320	123	21
Future Volume (veh/h)	973	584	0	1320	123	21
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1058	342	0	1435	134	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1726	770	0	1726	1547	709
Arrive On Green	0.49	0.49	0.00	0.49	0.45	0.45
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1058	342	0	1435	134	7
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	26.2	17.0	0.0	41.8	2.7	0.3
Cycle Q Clear(g_c), s	26.2	17.0	0.0	41.8	2.7	0.3
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1726	770	0	1726	1547	709
V/C Ratio(X)	0.61	0.44	0.00	0.83	0.09	0.01
Avail Cap(c_a), veh/h	2636	1176	0	2636	1547	709
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.6	20.2	0.0	26.6	19.1	18.4
Incr Delay (d2), s/veh	0.4	0.4	0.0	1.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	6.3	0.0	16.7	1.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.9	20.6	0.0	28.1	19.2	18.4
LnGrp LOS	C	C	A	C	B	B
Approach Vol, veh/h	1400			1435	141	
Approach Delay, s/veh	22.4			28.1	19.1	
Approach LOS	C			C	B	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	57.7			62.3		62.3
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	22.5			88.5		88.5
Max Q Clear Time (g_c+I1), s	4.7			28.2		43.8
Green Ext Time (p_c), s	0.4			12.7		14.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			25.0			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Prewett Ranch Drive & Hillcrest Avenue

The Ranch  
Existing Plus Project AM Peak Hour




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	205	40	43	5	5	145
Future Volume (veh/h)	205	40	43	5	5	145
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	238	47	50	6	6	169
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	305	629	160	136	900	801
Arrive On Green	0.17	0.34	0.09	0.09	0.51	0.51
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	238	47	50	6	6	169
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	6.4	0.9	1.3	0.2	0.1	3.0
Cycle Q Clear(g_c), s	6.4	0.9	1.3	0.2	0.1	3.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	305	629	160	136	900	801
V/C Ratio(X)	0.78	0.07	0.31	0.04	0.01	0.21
Avail Cap(c_a), veh/h	318	1167	686	581	900	801
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	11.4	21.7	21.2	6.2	6.9
Incr Delay (d2), s/veh	11.3	0.0	1.1	0.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.3	0.6	0.1	0.0	3.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.3	11.5	22.8	21.3	6.2	7.5
LnGrp LOS	C	B	C	C	A	A
Approach Vol, veh/h		285	56		175	
Approach Delay, s/veh		28.1	22.6		7.5	
Approach LOS		C	C		A	
Timer - Assigned Phs			4	6	7	8
Phs Duration (G+Y+Rc), s			21.0	29.5	12.7	8.3
Change Period (Y+Rc), s			4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s			31.0	25.0	8.5	18.0
Max Q Clear Time (g_c+I1), s			2.9	5.0	8.4	3.3
Green Ext Time (p_c), s			0.2	0.5	0.0	0.1
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			20.5			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Existing Plus Project PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔		↗	↔↔	↕↕			↕↕↕	↗
Traffic Volume (veh/h)	0	0	0	193	0	232	667	728	0	0	577	421
Future Volume (veh/h)	0	0	0	193	0	232	667	728	0	0	577	421
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				197	0	43	681	743	0	0	589	116
Peak Hour Factor				0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %				1	0	1	1	1	0	0	1	1
Cap, veh/h				503	0	231	938	2256	0	0	1606	394
Arrive On Green				0.14	0.00	0.14	0.27	0.63	0.00	0.00	0.25	0.25
Sat Flow, veh/h				3483	0	1598	3483	3676	0	0	6749	1591
Grp Volume(v), veh/h				197	0	43	681	743	0	0	589	116
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1742	1791	0	0	1621	1591
Q Serve(g_s), s				1.8	0.0	0.8	6.3	3.4	0.0	0.0	2.7	2.1
Cycle Q Clear(g_c), s				1.8	0.0	0.8	6.3	3.4	0.0	0.0	2.7	2.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				503	0	231	938	2256	0	0	1606	394
V/C Ratio(X)				0.39	0.00	0.19	0.73	0.33	0.00	0.00	0.37	0.29
Avail Cap(c_a), veh/h				4224	0	1938	4421	8991	0	0	7316	1795
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				13.8	0.0	13.3	11.8	3.1	0.0	0.0	11.0	10.8
Incr Delay (d2), s/veh				0.2	0.0	0.1	0.4	0.0	0.0	0.0	0.1	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.5	0.0	0.2	1.6	0.1	0.0	0.0	0.6	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				13.9	0.0	13.5	12.2	3.1	0.0	0.0	11.1	11.0
LnGrp LOS				B	A	B	B	A	A	A	B	B
Approach Vol, veh/h					240			1424			705	
Approach Delay, s/veh					13.9			7.4			11.1	
Approach LOS					B			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		26.3			13.6	12.8		9.1				
Change Period (Y+Rc), s		5.3			4.0	5.3		5.3				
Max Green Setting (Gmax), s		87.7			45.0	38.7		41.7				
Max Q Clear Time (g_c+I1), s		5.4			8.3	4.7		3.8				
Green Ext Time (p_c), s		3.2			1.3	2.7		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				9.2								
HCM 6th LOS				A								












# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Existing Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  			 	
Traffic Volume (veh/h)	455	0	907	0	0	0	0	940	255	269	500	0
Future Volume (veh/h)	455	0	907	0	0	0	0	940	255	269	500	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	474	0	945				0	979	230	280	521	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1442	0	1283				0	1562	361	393	1614	0
Arrive On Green	0.40	0.00	0.40				0.00	0.29	0.27	0.11	0.45	0.00
Sat Flow, veh/h	3591	0	3195				0	5562	1225	3483	3676	0
Grp Volume(v), veh/h	474	0	945				0	897	312	280	521	0
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1621	1660	1742	1791	0
Q Serve(g_s), s	5.7	0.0	15.8				0.0	10.0	10.3	4.9	5.9	0.0
Cycle Q Clear(g_c), s	5.7	0.0	15.8				0.0	10.0	10.3	4.9	5.9	0.0
Prop In Lane	1.00		1.00				0.00		0.74	1.00		0.00
Lane Grp Cap(c), veh/h	1442	0	1283				0	1434	489	393	1614	0
V/C Ratio(X)	0.33	0.00	0.74				0.00	0.63	0.64	0.71	0.32	0.00
Avail Cap(c_a), veh/h	4853	0	4318				0	2320	792	720	2677	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.0	0.0	16.0				0.0	19.2	19.7	26.9	11.1	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.8				0.0	0.2	0.5	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	4.8				0.0	3.2	3.5	1.9	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.1	0.0	16.8				0.0	19.3	20.2	27.8	11.2	0.0
LnGrp LOS	B	A	B				A	B	C	C	B	A
Approach Vol, veh/h	1419						1209			801		
Approach Delay, s/veh	15.6						19.6			17.0		
Approach LOS	B						B			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	11.1	22.5	29.3		33.6							
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	18.0	28.7	84.5		* 47							
Max Q Clear Time (g_c+10), s	10.5	12.3	17.8		7.9							
Green Ext Time (p_c), s	0.3	4.8	7.0		2.1							

### Intersection Summary

HCM 6th Ctrl Delay	17.3
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.
















\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Existing Plus Project PM Peak Hour

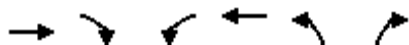


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	  		 	
Traffic Volume (veh/h)	33	18	101	750	91	162	162	556	776	50	527	29
Future Volume (veh/h)	33	18	101	750	91	162	162	556	776	50	527	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	19	12	773	94	124	167	573	257	52	543	27
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	54	99	63	1066	201	265	216	1003	777	147	838	42
Arrive On Green	0.03	0.09	0.08	0.21	0.27	0.26	0.12	0.28	0.28	0.08	0.24	0.22
Sat Flow, veh/h	1781	1065	673	5023	732	965	1781	3554	2751	1781	3445	171
Grp Volume(v), veh/h	34	0	31	773	0	218	167	573	257	52	280	290
Grp Sat Flow(s),veh/h/ln	1781	0	1737	1674	0	1697	1781	1777	1376	1781	1777	1840
Q Serve(g_s), s	0.9	0.0	0.8	6.9	0.0	5.2	4.4	6.7	3.6	1.3	6.9	6.9
Cycle Q Clear(g_c), s	0.9	0.0	0.8	6.9	0.0	5.2	4.4	6.7	3.6	1.3	6.9	6.9
Prop In Lane	1.00		0.39	1.00		0.57	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	54	0	162	1066	0	467	216	1003	777	147	432	448
V/C Ratio(X)	0.63	0.00	0.19	0.72	0.00	0.47	0.77	0.57	0.33	0.35	0.65	0.65
Avail Cap(c_a), veh/h	367	0	1182	2071	0	1504	845	4909	3800	147	1758	1821
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	0.0	20.4	17.8	0.0	14.8	20.7	14.9	13.8	21.0	16.5	16.5
Incr Delay (d2), s/veh	4.4	0.0	0.2	0.4	0.0	0.3	2.2	0.2	0.1	0.5	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.3	2.2	0.0	1.6	1.7	2.1	0.9	0.5	2.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	0.0	20.6	18.1	0.0	15.1	22.9	15.1	13.9	21.6	17.1	17.1
LnGrp LOS	C	A	C	B	A	B	C	B	B	C	B	B
Approach Vol, veh/h	65		991			997			622			
Approach Delay, s/veh	24.3		17.5			16.1			17.5			
Approach LOS	C		B			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	17.7	14.3	8.5	9.9	15.8	5.5	17.3				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	66.1	20.0	32.4	23.0	47.1	10.0	42.4				
Max Q Clear Time (g_c+I), s	13.3	8.7	8.9	2.8	6.4	8.9	2.9	7.2				
Green Ext Time (p_c), s	0.0	3.0	1.3	0.1	0.2	1.9	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay	17.1											
HCM 6th LOS	B											

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Existing Plus Project PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	235	609	48	488	515	95
Future Volume (veh/h)	235	609	48	488	515	95
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	245	214	50	508	536	24
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	940	415	253	887	820	376
Arrive On Green	0.27	0.27	0.07	0.48	0.24	0.24
Sat Flow, veh/h	3589	1545	3401	1841	3401	1560
Grp Volume(v), veh/h	245	214	50	508	536	24
Grp Sat Flow(s), veh/h/ln	1749	1545	1700	1841	1700	1560
Q Serve(g_s), s	1.6	3.4	0.4	5.7	4.1	0.3
Cycle Q Clear(g_c), s	1.6	3.4	0.4	5.7	4.1	0.3
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	940	415	253	887	820	376
V/C Ratio(X)	0.26	0.52	0.20	0.57	0.65	0.06
Avail Cap(c_a), veh/h	4238	1873	659	2842	2049	940
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.3	9.0	12.6	5.4	9.9	8.4
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.6	0.1	0.5	1.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.4	9.3	12.9	5.6	10.2	8.5
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	459			558	560	
Approach Delay, s/veh	8.8			6.2	10.1	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		11.0	6.2	11.8		17.9
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		17.4	5.1	34.4		44.0
Max Q Clear Time (g_c+I1), s		6.1	2.4	5.4		7.7
Green Ext Time (p_c), s		0.9	0.0	1.2		1.8
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			8.4			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Existing Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱		↰↱↰↱					↑↑↑↑		↰↱↰↱	↑↑↑↑	
Traffic Volume (veh/h)	305	0	1389	0	0	0	14	1189	439	333	839	0
Future Volume (veh/h)	305	0	1389	0	0	0	14	1189	439	333	839	0
Initial Q (Qb), veh	0	0	20				0	20	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No					No			No		
Adj Sat Flow, veh/h/ln	1885	0	1885				1885	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	311	0	983				14	1213	391	340	856	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	0	1				1	1	1	1	1	0
Cap, veh/h	964	0	700				53	1728	507	426	3261	0
Arrive On Green	0.31	0.00	0.31				0.40	0.40	0.39	0.13	0.59	0.00
Sat Flow, veh/h	3483	0	3643				18	4069	1299	3483	5316	0
Grp Volume(v), veh/h	311	0	983				556	617	444	340	856	0
Grp Sat Flow(s), veh/h/ln	1742	0	1214				1851	1029	1476	1742	1716	0
Q Serve(g_s), s	5.3	0.0	20.1				0.9	20.3	20.5	7.5	6.5	0.0
Cycle Q Clear(g_c), s	5.3	0.0	20.1				19.9	20.3	20.5	7.5	6.5	0.0
Prop In Lane	1.00		1.00				0.03		0.88	1.00		0.00
Lane Grp Cap(c), veh/h	964	0	700				799	850	605	426	3261	0
V/C Ratio(X)	0.32	0.00	1.40				0.70	0.73	0.73	0.80	0.26	0.00
Avail Cap(c_a), veh/h	1149	0	1201				1916	2115	1516	928	5287	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.5	0.0	54.6				20.4	20.7	20.9	40.6	7.2	0.0
Incr Delay (d2), s/veh	0.1	0.0	187.3				0.4	0.4	0.7	1.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	102.8				0.9	3.6	1.9	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	26.6				8.7	5.6	7.5	3.8	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.6	0.0	344.8				21.7	24.8	23.4	41.9	7.2	0.0
LnGrp LOS	C	A	F				C	C	C	D	A	A
Approach Vol, veh/h		1294						1618			1196	
Approach Delay, s/veh		268.8						23.4			17.1	
Approach LOS		F						C			B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	4.8	35.5		28.5		50.4						
Change Period (Y+Rc), s	4.9	* 4.9		5.3		4.9						
Max Green Setting (Gmax), s	1.0	* 80		24.7		80.1						
Max Q Clear Time (g_c+I19.5	22.5			22.1		8.5						
Green Ext Time (p_c), s	0.5	8.1		1.1		3.9						

### Intersection Summary

HCM 6th Ctrl Delay	98.8
HCM 6th LOS	F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Contra Loma Plaza/Davison Drive

The Ranch  
Existing Plus Project PM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗	↗	↖	↖		↖	↗	↗
Traffic Volume (veh/h)	55	46	58	137	32	123	56	833	113	195	1049	24
Future Volume (veh/h)	55	46	58	137	32	123	56	833	113	195	1049	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	56	47	7	140	33	19	57	850	109	199	1070	23
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	99	83	157	228	240	203	78	1159	149	326	1482	32
Arrive On Green	0.10	0.10	0.10	0.13	0.13	0.13	0.04	0.36	0.35	0.09	0.41	0.40
Sat Flow, veh/h	998	837	1574	1795	1885	1594	1795	3187	409	3483	3585	77
Grp Volume(v), veh/h	103	0	7	140	33	19	57	478	481	199	535	558
Grp Sat Flow(s), veh/h/ln	1835	0	1574	1795	1885	1594	1795	1791	1805	1742	1791	1871
Q Serve(g_s), s	2.7	0.0	0.2	3.7	0.8	0.5	1.6	11.7	11.7	2.8	12.6	12.6
Cycle Q Clear(g_c), s	2.7	0.0	0.2	3.7	0.8	0.5	1.6	11.7	11.7	2.8	12.6	12.6
Prop In Lane	0.54		1.00	1.00		1.00	1.00		0.23	1.00		0.04
Lane Grp Cap(c), veh/h	183	0	157	228	240	203	78	651	656	326	741	774
V/C Ratio(X)	0.56	0.00	0.04	0.61	0.14	0.09	0.73	0.73	0.73	0.61	0.72	0.72
Avail Cap(c_a), veh/h	1269	0	1088	1348	1416	1197	568	2654	2675	1101	2654	2773
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	0.0	20.6	20.9	19.6	19.5	23.9	14.0	14.0	22.0	12.4	12.4
Incr Delay (d2), s/veh	1.0	0.0	0.0	1.0	0.1	0.1	4.8	0.6	0.6	0.7	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.1	1.4	0.3	0.2	0.7	3.6	3.7	1.1	4.2	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	0.0	20.7	21.9	19.7	19.6	28.7	14.6	14.6	22.7	12.9	12.9
LnGrp LOS	C	A	C	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		110			192			1016			1292	
Approach Delay, s/veh		22.6			21.3			15.4			14.4	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	22.4		9.0	6.2	24.9		10.4				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+14), s	14.8	13.7		4.7	3.6	14.6		5.7				
Green Ext Time (p_c), s	0.3	3.7		0.3	0.0	5.5		0.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			15.7									
HCM 6th LOS			B									

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Existing Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	162	101	39	84	503	117	774	33	747	989	160
Future Volume (veh/h)	166	162	101	39	84	503	117	774	33	747	989	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	171	167	37	40	87	519	121	798	33	770	1020	91
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	207	770	167	51	630	1177	289	998	41	868	1286	727
Arrive On Green	0.12	0.26	0.26	0.03	0.18	0.17	0.16	0.28	0.27	0.25	0.36	0.34
Sat Flow, veh/h	1795	2928	634	1795	3582	2812	1795	3504	145	3483	3582	1576
Grp Volume(v), veh/h	171	101	103	40	87	519	121	408	423	770	1020	91
Grp Sat Flow(s),veh/h/ln	1795	1791	1771	1795	1791	1406	1795	1791	1858	1742	1791	1576
Q Serve(g_s), s	8.5	4.0	4.2	2.0	1.9	12.0	5.6	19.3	19.3	19.5	23.4	1.2
Cycle Q Clear(g_c), s	8.5	4.0	4.2	2.0	1.9	12.0	5.6	19.3	19.3	19.5	23.4	1.2
Prop In Lane	1.00		0.36	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	207	471	466	51	630	1177	289	510	529	868	1286	727
V/C Ratio(X)	0.83	0.21	0.22	0.79	0.14	0.44	0.42	0.80	0.80	0.89	0.79	0.13
Avail Cap(c_a), veh/h	432	1409	1393	216	2387	2556	289	978	1015	1180	2740	1367
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.6	26.3	26.5	44.2	31.8	19.0	34.6	30.3	30.4	33.1	26.3	4.7
Incr Delay (d2), s/veh	3.2	0.1	0.1	9.8	0.0	0.1	0.4	1.1	1.1	5.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	1.6	1.7	1.0	0.8	3.6	2.3	7.9	8.2	8.7	9.6	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.8	26.4	26.6	54.0	31.9	19.1	34.9	31.4	31.4	38.4	26.7	4.7
LnGrp LOS	D	C	C	D	C	B	C	C	C	D	C	A
Approach Vol, veh/h	375			646			952			1881		
Approach Delay, s/veh	33.9			23.0			31.9			30.5		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.8	30.1	6.6	28.1	20.0	36.9	14.5	20.1				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	1.0	48.7	11.0	71.4	11.0	* 69	22.0	60.4				
Max Q Clear Time (g_c+0), s	1.5	21.3	4.0	6.2	7.6	25.4	10.5	14.0				
Green Ext Time (p_c), s	1.3	3.0	0.0	0.7	0.0	6.0	0.2	1.5				

### Intersection Summary

HCM 6th Ctrl Delay 29.9  
HCM 6th LOS C

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Existing Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	77	766	6	41	54	492	803	9	58	1066	158
Future Volume (veh/h)	134	77	766	6	41	54	492	803	9	58	1066	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	111	123	88	6	43	3	518	845	5	61	1122	153
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	216	227	384	9	64	62	662	1885	820	77	1679	229
Arrive On Green	0.12	0.12	0.12	0.04	0.04	0.04	0.19	0.53	0.53	0.04	0.37	0.36
Sat Flow, veh/h	1795	1885	3195	229	1644	1598	3483	3582	1558	1795	4571	623
Grp Volume(v), veh/h	111	123	88	49	0	3	518	845	5	61	842	433
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1874	0	1598	1742	1791	1558	1795	1716	1763
Q Serve(g_s), s	3.4	3.6	1.5	1.5	0.0	0.1	8.3	8.6	0.1	2.0	12.1	12.2
Cycle Q Clear(g_c), s	3.4	3.6	1.5	1.5	0.0	0.1	8.3	8.6	0.1	2.0	12.1	12.2
Prop In Lane	1.00		1.00	0.12		1.00	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	216	227	384	73	0	62	662	1885	820	77	1260	648
V/C Ratio(X)	0.51	0.54	0.23	0.67	0.00	0.05	0.78	0.45	0.01	0.79	0.67	0.67
Avail Cap(c_a), veh/h	671	704	1193	1241	0	1058	1478	3284	1428	274	2214	1137
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	24.4	23.4	27.9	0.0	27.3	22.7	8.6	6.6	27.9	15.6	15.7
Incr Delay (d2), s/veh	0.7	0.8	0.1	4.0	0.0	0.1	0.8	0.1	0.0	6.7	0.2	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.5	0.5	0.7	0.0	0.0	3.0	2.3	0.0	0.9	4.2	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	25.0	25.1	23.6	31.9	0.0	27.4	23.5	8.7	6.6	34.6	15.9	16.2
LnGrp LOS	C	C	C	C	A	C	C	A	A	C	B	B
Approach Vol, veh/h	322			52			1368			1336		
Approach Delay, s/veh	24.7			31.6			14.3			16.8		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.5	35.0		11.1	15.2	26.3		6.3				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	9.0	52.7		21.1	25.0	* 37		39.0				
Max Q Clear Time (g_c+14), s	14.0	10.6		5.6	10.3	14.2		3.5				
Green Ext Time (p_c), s	0.0	3.8		0.6	0.9	6.5		0.1				

### Intersection Summary

HCM 6th Ctrl Delay 16.8

HCM 6th LOS B

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Existing Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱ ↱ ↱			↰ ↱ ↱ ↱			↰ ↱		↱	↰ ↱		↱
Traffic Volume (veh/h)	104	944	441	113	720	39	295	55	86	48	32	78
Future Volume (veh/h)	104	944	441	113	720	39	295	55	86	48	32	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	108	983	365	118	750	14	307	57	28	50	33	16
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	140	1391	516	178	2072	39	431	399	336	68	150	73
Arrive On Green	0.08	0.38	0.37	0.10	0.40	0.40	0.12	0.21	0.21	0.04	0.13	0.10
Sat Flow, veh/h	1795	3683	1367	1795	5199	97	3483	1885	1586	1795	1195	580
Grp Volume(v), veh/h	108	916	432	118	495	269	307	57	28	50	0	49
Grp Sat Flow(s),veh/h/ln	1795	1716	1619	1795	1716	1865	1742	1885	1586	1795	0	1775
Q Serve(g_s), s	3.4	13.2	13.3	3.7	5.9	5.9	5.0	1.4	0.8	1.6	0.0	1.5
Cycle Q Clear(g_c), s	3.4	13.2	13.3	3.7	5.9	5.9	5.0	1.4	0.8	1.6	0.0	1.5
Prop In Lane	1.00		0.84	1.00		0.05	1.00		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	140	1296	611	178	1367	743	431	399	336	68	0	223
V/C Ratio(X)	0.77	0.71	0.71	0.66	0.36	0.36	0.71	0.14	0.08	0.73	0.00	0.22
Avail Cap(c_a), veh/h	522	3110	1467	522	3110	1691	834	1451	1221	276	0	1214
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.4	15.4	15.5	25.4	12.4	12.4	24.6	18.7	18.5	27.8	0.0	23.2
Incr Delay (d2), s/veh	3.3	0.3	0.6	1.6	0.1	0.1	0.8	0.1	0.0	5.5	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	4.1	4.0	1.5	1.8	2.0	1.8	0.5	0.3	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	15.7	16.1	27.0	12.4	12.5	25.4	18.8	18.5	33.3	0.0	23.4
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	A	C
Approach Vol, veh/h	1456			882			392			99		
Approach Delay, s/veh	16.9			14.4			24.0			28.4		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.2	16.4	9.8	26.1	11.2	11.4	8.6	27.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	4.0	43.7	17.0	* 53	14.0	38.7	17.0	* 53				
Max Q Clear Time (g_c+13.6)	13.6	3.4	5.7	15.3	7.0	3.5	5.4	7.9				
Green Ext Time (p_c), s	0.0	0.2	0.1	6.6	0.3	0.1	0.1	3.0				

### Intersection Summary

HCM 6th Ctrl Delay 17.5

HCM 6th LOS B





















### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Existing Plus Project PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	736	178	312	524	176	267	325	239	252	335	24
Future Volume (veh/h)	67	736	178	312	524	176	267	325	239	252	335	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	70	767	46	325	546	74	278	339	142	262	349	21
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	91	1295	77	371	1917	256	375	547	225	360	748	45
Arrive On Green	0.05	0.26	0.24	0.20	0.41	0.40	0.11	0.22	0.20	0.10	0.22	0.20
Sat Flow, veh/h	1810	4995	298	1810	4628	618	3510	2482	1019	3510	3458	207
Grp Volume(v), veh/h	70	530	283	325	406	214	278	245	236	262	181	189
Grp Sat Flow(s),veh/h/ln	1810	1729	1835	1810	1729	1789	1755	1805	1695	1755	1805	1860
Q Serve(g_s), s	2.9	10.1	10.2	13.1	5.9	6.0	5.8	9.2	9.6	5.4	6.6	6.7
Cycle Q Clear(g_c), s	2.9	10.1	10.2	13.1	5.9	6.0	5.8	9.2	9.6	5.4	6.6	6.7
Prop In Lane	1.00		0.16	1.00		0.35	1.00		0.60	1.00		0.11
Lane Grp Cap(c), veh/h	91	897	476	371	1432	741	375	398	374	360	391	403
V/C Ratio(X)	0.77	0.59	0.59	0.88	0.28	0.29	0.74	0.61	0.63	0.73	0.46	0.47
Avail Cap(c_a), veh/h	265	1931	1025	601	2574	1332	653	984	924	747	1032	1063
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	24.4	24.5	29.0	14.6	14.8	32.6	26.4	26.9	32.7	25.7	25.8
Incr Delay (d2), s/veh	5.1	0.2	0.4	4.9	0.0	0.1	1.1	0.6	0.7	1.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	3.8	4.1	5.7	2.0	2.1	2.3	3.7	3.6	2.2	2.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.5	24.6	24.9	33.9	14.7	14.9	33.7	27.0	27.6	33.8	26.0	26.1
LnGrp LOS	D	C	C	C	B	B	C	C	C	C	C	C
Approach Vol, veh/h		883			945			759			632	
Approach Delay, s/veh		26.0			21.3			29.6			29.3	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.7	20.6	19.4	23.5	12.0	20.3	7.8	35.2				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7				
Max Q Clear Time (g_c+I1), s	7.4	11.6	15.1	12.2	7.8	8.7	4.9	8.0				
Green Ext Time (p_c), s	0.3	1.6	0.3	3.2	0.3	1.2	0.0	2.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				26.1								
HCM 6th LOS				C								

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Existing Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↑↑ ↱			↰ ↑↑ ↱			↰ ↱		↰ ↱		↰ ↱	
Traffic Volume (veh/h)	171	887	15	78	950	227	31	53	42	523	96	98
Future Volume (veh/h)	171	887	15	78	950	227	31	53	42	523	96	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	178	924	6	81	990	62	32	55	10	545	100	26
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	222	1919	12	105	1535	469	49	420	74	668	1086	475
Arrive On Green	0.12	0.36	0.34	0.06	0.30	0.30	0.03	0.14	0.12	0.19	0.30	0.30
Sat Flow, veh/h	1795	5276	34	1795	5147	1574	1795	3035	536	3483	3582	1568
Grp Volume(v), veh/h	178	601	329	81	990	62	32	32	33	545	100	26
Grp Sat Flow(s),veh/h/ln	1795	1716	1879	1795	1716	1574	1795	1791	1781	1742	1791	1568
Q Serve(g_s), s	6.2	8.7	8.7	2.9	10.8	1.9	1.1	1.0	1.1	9.7	1.3	0.8
Cycle Q Clear(g_c), s	6.2	8.7	8.7	2.9	10.8	1.9	1.1	1.0	1.1	9.7	1.3	0.8
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	222	1248	683	105	1535	469	49	248	246	668	1086	475
V/C Ratio(X)	0.80	0.48	0.48	0.77	0.65	0.13	0.66	0.13	0.13	0.82	0.09	0.05
Avail Cap(c_a), veh/h	389	2619	1434	306	3690	1129	139	1240	1232	1025	3256	1425
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.5	15.8	15.9	30.0	19.7	16.6	31.1	24.4	24.6	25.0	16.1	15.9
Incr Delay (d2), s/veh	2.5	0.1	0.2	4.5	0.2	0.0	5.5	0.1	0.1	1.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.9	3.2	1.3	3.7	0.6	0.5	0.4	0.4	3.7	0.5	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.1	16.0	16.1	34.5	19.9	16.6	36.7	24.5	24.7	26.6	16.1	16.0
LnGrp LOS	C	B	B	C	B	B	D	C	C	C	B	B
Approach Vol, veh/h	1108			1133			97			671		
Approach Delay, s/veh	18.2			20.7			28.6			24.6		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.9	7.8	27.5	5.7	23.6	12.0	23.3					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	11.0	48.0	5.0	57.4	14.0	45.0					
Max Q Clear Time (g_c+I1), s	3.1	4.9	10.7	3.1	3.3	8.2	12.8					
Green Ext Time (p_c), s	0.7	0.2	0.0	3.8	0.0	0.4	0.1	4.7				

### Intersection Summary

HCM 6th Ctrl Delay	20.9
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Existing Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1547	677	152	1597	0	0	0	0	674	3	666
Future Volume (veh/h)	0	1547	677	152	1597	0	0	0	0	674	3	666
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1628	305	160	1681	0				711	0	673
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1859	566	191	2529	0				1615	0	719
Arrive On Green	0.00	0.36	0.36	0.10	0.49	0.00				0.45	0.00	0.45
Sat Flow, veh/h	0	5358	1579	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	1628	305	160	1681	0				711	0	673
Grp Sat Flow(s),veh/h/ln	0	1729	1579	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	35.5	18.6	9.5	29.7	0.0				16.4	0.0	48.0
Cycle Q Clear(g_c), s	0.0	35.5	18.6	9.5	29.7	0.0				16.4	0.0	48.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1859	566	191	2529	0				1615	0	719
V/C Ratio(X)	0.00	0.88	0.54	0.84	0.66	0.00				0.44	0.00	0.94
Avail Cap(c_a), veh/h	0	1975	601	264	2834	0				1977	0	880
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	36.2	30.8	53.7	23.5	0.0				23.0	0.0	31.8
Incr Delay (d2), s/veh	0.0	4.3	0.3	11.6	0.4	0.0				0.1	0.0	14.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.9	6.8	2.6	11.4	0.0				6.7	0.0	20.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	40.5	31.2	65.3	23.8	0.0				23.1	0.0	45.9
LnGrp LOS	A	D	C	E	C	A				C	A	D
Approach Vol, veh/h		1933			1841						1384	
Approach Delay, s/veh		39.0			27.4						34.2	
Approach LOS		D			C						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.6	47.3		57.9		62.9						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	6.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I1), s	11.5	37.5		50.0		31.7						
Green Ext Time (p_c), s	0.1	4.6		2.6		9.5						

### Intersection Summary

HCM 6th Ctrl Delay	33.6
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Existing Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1774	447	38	1046	453	703	38	243	0	0	0
Future Volume (veh/h)	0	1774	447	38	1046	453	703	38	243	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	0	1867	304	40	1101	265	769	0	109			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	1	1	1	1	1	1	1	1			
Cap, veh/h	0	2615	799	57	3097	935	985	0	438			
Arrive On Green	0.00	0.51	0.51	0.03	0.60	0.60	0.27	0.00	0.27			
Sat Flow, veh/h	0	5316	1573	1795	5147	1553	3591	0	1598			
Grp Volume(v), veh/h	0	1867	304	40	1101	265	769	0	109			
Grp Sat Flow(s),veh/h/ln	0	1716	1573	1795	1716	1553	1795	0	1598			
Q Serve(g_s), s	0.0	18.1	7.6	1.4	7.0	5.3	12.8	0.0	3.4			
Cycle Q Clear(g_c), s	0.0	18.1	7.6	1.4	7.0	5.3	12.8	0.0	3.4			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2615	799	57	3097	935	985	0	438			
V/C Ratio(X)	0.00	0.71	0.38	0.70	0.36	0.28	0.78	0.00	0.25			
Avail Cap(c_a), veh/h	0	3827	1169	306	5022	1516	2725	0	1213			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	12.3	9.7	31.0	6.5	6.2	21.6	0.0	18.2			
Incr Delay (d2), s/veh	0.0	0.1	0.1	5.7	0.0	0.1	0.5	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	5.2	2.0	0.7	1.7	1.2	4.7	0.0	1.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.4	9.8	36.7	6.5	6.2	22.1	0.0	18.4			
LnGrp LOS	A	B	A	D	A	A	C	A	B			
Approach Vol, veh/h		2171			1406			878				
Approach Delay, s/veh		12.0			7.3			21.7				
Approach LOS		B			A			C				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	6.0	36.8		21.7		42.8						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	1.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+I), s	13.4	20.1		14.8		9.0						
Green Ext Time (p_c), s	0.0	11.4		1.6		6.0						

## Intersection Summary

HCM 6th Ctrl Delay	12.5
HCM 6th LOS	B

## Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Existing Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	51	4	23	47	150	14	167	17	186	310	38
Future Volume (veh/h)	34	51	4	23	47	150	14	167	17	186	310	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	37	55	2	25	51	69	15	180	10	200	333	33
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	205	170	6	205	68	92	205	582	32	301	731	72
Arrive On Green	0.11	0.09	0.09	0.11	0.09	0.09	0.11	0.17	0.13	0.17	0.22	0.19
Sat Flow, veh/h	1795	1807	66	1795	726	982	1795	3451	191	1795	3292	324
Grp Volume(v), veh/h	37	0	57	25	0	120	15	93	97	200	180	186
Grp Sat Flow(s),veh/h/ln	1795	0	1873	1795	0	1708	1795	1791	1851	1795	1791	1825
Q Serve(g_s), s	0.7	0.0	1.0	0.4	0.0	2.4	0.3	1.6	1.6	3.7	3.1	3.1
Cycle Q Clear(g_c), s	0.7	0.0	1.0	0.4	0.0	2.4	0.3	1.6	1.6	3.7	3.1	3.1
Prop In Lane	1.00		0.04	1.00		0.57	1.00		0.10	1.00		0.18
Lane Grp Cap(c), veh/h	205	0	176	205	0	160	205	302	312	301	398	405
V/C Ratio(X)	0.18	0.00	0.32	0.12	0.00	0.75	0.07	0.31	0.31	0.67	0.45	0.46
Avail Cap(c_a), veh/h	563	0	1921	563	0	1752	1074	2603	2690	1074	2603	2652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.1	0.0	14.9	14.0	0.0	15.5	13.9	12.8	12.9	13.7	11.8	11.9
Incr Delay (d2), s/veh	0.2	0.0	0.4	0.1	0.0	2.6	0.1	0.2	0.2	0.9	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.3	0.1	0.0	0.8	0.1	0.5	0.5	1.1	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.2	0.0	15.3	14.1	0.0	18.1	13.9	13.0	13.1	14.6	12.1	12.2
LnGrp LOS	B	A	B	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	94		145				205			566		
Approach Delay, s/veh	14.8		17.4				13.1			13.0		
Approach LOS	B		B				B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	9.9	8.0	7.3	8.0	11.8	8.0	7.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+15, s)	3.6	3.6	2.4	3.0	2.3	5.1	2.7	4.4				
Green Ext Time (p_c), s	0.2	0.6	0.0	0.1	0.0	1.2	0.0	0.4				

## Intersection Summary

HCM 6th Ctrl Delay 13.8









HCM 6th LOS B

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Existing Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	105	60	71	90	72	123	619	162	107	612	88
Future Volume (veh/h)	65	105	60	71	90	72	123	619	162	107	612	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	70	113	45	76	97	48	132	666	158	115	658	86
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	97	156	62	102	149	74	173	1014	240	150	1083	141
Arrive On Green	0.05	0.12	0.12	0.06	0.12	0.12	0.10	0.35	0.32	0.08	0.34	0.31
Sat Flow, veh/h	1810	1293	515	1810	1200	594	1810	2895	686	1810	3210	419
Grp Volume(v), veh/h	70	0	158	76	0	145	132	415	409	115	370	374
Grp Sat Flow(s),veh/h/ln	1810	0	1807	1810	0	1793	1810	1805	1776	1810	1805	1825
Q Serve(g_s), s	1.6	0.0	3.5	1.7	0.0	3.2	2.9	8.0	8.0	2.6	7.0	7.1
Cycle Q Clear(g_c), s	1.6	0.0	3.5	1.7	0.0	3.2	2.9	8.0	8.0	2.6	7.0	7.1
Prop In Lane	1.00		0.28	1.00		0.33	1.00		0.39	1.00		0.23
Lane Grp Cap(c), veh/h	97	0	219	102	0	222	173	632	622	150	609	616
V/C Ratio(X)	0.72	0.00	0.72	0.74	0.00	0.65	0.76	0.66	0.66	0.77	0.61	0.61
Avail Cap(c_a), veh/h	485	0	1628	441	0	1572	837	1758	1730	749	1670	1688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	0.0	17.4	19.1	0.0	17.1	18.1	11.3	11.5	18.4	11.3	11.5
Incr Delay (d2), s/veh	3.8	0.0	1.7	4.0	0.0	1.2	2.6	0.4	0.4	3.1	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	1.2	0.7	0.0	1.1	1.1	2.1	2.2	1.0	1.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	0.0	19.1	23.0	0.0	18.4	20.7	11.7	11.9	21.5	11.7	11.8
LnGrp LOS	C	A	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	228					221		956		859		
Approach Delay, s/veh	20.3					20.0		13.1		13.1		
Approach LOS	C					B		B		B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.4	18.4	6.3	9.0	7.9	17.9	6.2	9.1				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	7.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0				
Max Q Clear Time (g_c+14.6)	14.6	10.0	3.7	5.5	4.9	9.1	3.6	5.2				
Green Ext Time (p_c), s	0.1	3.0	0.0	0.5	0.1	2.6	0.0	0.4				

### Intersection Summary

HCM 6th Ctrl Delay	14.5
HCM 6th LOS	B













# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Existing Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	0	28	39	0	249	32	625	15	53	466	207
Future Volume (veh/h)	88	0	28	39	0	249	32	625	15	53	466	207
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	1870	1870	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	96	0	4	45	0	117	35	727	4	62	542	225
Peak Hour Factor	0.92	0.92	0.92	0.86	0.92	0.86	0.92	0.86	0.86	0.86	0.86	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	0	0	0	0	0
Cap, veh/h	169	0	260	71	0	153	94	1244	542	90	850	352
Arrive On Green	0.09	0.00	0.15	0.04	0.00	0.10	0.05	0.34	0.34	0.05	0.34	0.31
Sat Flow, veh/h	1781	0	1585	1810	0	1585	1781	3610	1574	1810	2489	1030
Grp Volume(v), veh/h	96	0	4	45	0	117	35	727	4	62	393	374
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1810	0	1585	1781	1805	1574	1810	1805	1715
Q Serve(g_s), s	2.1	0.0	0.1	1.0	0.0	2.9	0.8	6.6	0.1	1.3	7.3	7.4
Cycle Q Clear(g_c), s	2.1	0.0	0.1	1.0	0.0	2.9	0.8	6.6	0.1	1.3	7.3	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.60
Lane Grp Cap(c), veh/h	169	0	260	71	0	153	94	1244	542	90	616	586
V/C Ratio(X)	0.57	0.00	0.02	0.63	0.00	0.77	0.37	0.58	0.01	0.69	0.64	0.64
Avail Cap(c_a), veh/h	246	0	737	1545	0	1871	246	3673	1601	500	2086	1981
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	14.1	18.8	0.0	17.5	18.2	10.7	8.6	18.6	11.0	11.4
Incr Delay (d2), s/veh	3.0	0.0	0.0	3.4	0.0	3.0	2.4	0.2	0.0	3.4	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.4	0.0	0.9	0.3	1.7	0.0	0.5	1.9	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.2	0.0	14.2	22.2	0.0	20.5	20.6	10.9	8.6	22.0	11.4	11.8
LnGrp LOS	C	A	B	C	A	C	C	B	A	C	B	B
Approach Vol, veh/h	100				162				766			
Approach Delay, s/veh	20.0				21.0				11.3			
Approach LOS	B				C				B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.0	17.7	5.6	10.5	6.1	17.6	7.8	8.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.5	4.5	5.3	4.5	* 4.5				
Max Green Setting (Gmax), s	1.0	39.2	34.0	18.0	5.0	44.7	5.0	* 47				
Max Q Clear Time (g_c+I), s	13.3	8.6	3.0	2.1	2.8	9.4	4.1	4.9				
Green Ext Time (p_c), s	0.0	3.1	0.0	0.0	0.0	2.9	0.0	0.4				

### Intersection Summary

HCM 6th Ctrl Delay 13.1

HCM 6th LOS B

### Notes










\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Existing Plus Project PM Peak Hour











Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	0	59	74	0	57	103	291	37	24	298	52
Future Volume (veh/h)	109	0	59	74	0	57	103	291	37	24	298	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	124	0	7	84	0	7	117	331	34	27	339	48
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	400	238	202	478	0	202	163	1156	118	50	911	128
Arrive On Green	0.13	0.00	0.13	0.13	0.00	0.13	0.09	0.35	0.30	0.03	0.29	0.23
Sat Flow, veh/h	1431	1900	1610	1431	0	1610	1810	3307	337	1810	3179	446
Grp Volume(v), veh/h	124	0	7	84	0	7	117	180	185	27	191	196
Grp Sat Flow(s),veh/h/ln	1431	1900	1610	1431	0	1610	1810	1805	1839	1810	1805	1820
Q Serve(g_s), s	1.7	0.0	0.1	1.3	0.0	0.1	1.5	1.7	1.8	0.4	2.0	2.1
Cycle Q Clear(g_c), s	3.0	0.0	0.1	1.3	0.0	0.1	1.5	1.7	1.8	0.4	2.0	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		0.25
Lane Grp Cap(c), veh/h	400	238	202	478	0	202	163	631	643	50	518	522
V/C Ratio(X)	0.31	0.00	0.03	0.18	0.00	0.03	0.72	0.28	0.29	0.54	0.37	0.38
Avail Cap(c_a), veh/h	2833	3468	2939	2911	0	2939	2102	3669	3739	1126	2696	2718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.4	0.0	9.3	9.8	0.0	9.3	10.7	5.7	5.8	11.6	6.9	7.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	0.0	0.0	2.2	0.1	0.1	3.4	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.2	0.0	0.0	0.4	0.2	0.2	0.1	0.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.5	0.0	9.3	9.9	0.0	9.3	12.9	5.8	5.9	15.0	7.0	7.2
LnGrp LOS	B	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h	131					91		482		414		
Approach Delay, s/veh	11.4					9.8		7.5		7.6		
Approach LOS	B					A		A		A		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	4.7	12.4	7.0		6.2	10.9	7.0					
Change Period (Y+Rc), s	4.0	5.3	4.0		4.0	5.3	4.0					
Max Green Setting (Gmax), s	47.7	47.7	44.0		28.0	34.7	44.0					
Max Q Clear Time (g_c+I), s	12.4	3.8	5.0		3.5	4.1	3.3					
Green Ext Time (p_c), s	0.0	1.2	0.2		0.1	1.5	0.3					
Intersection Summary												
HCM 6th Ctrl Delay			8.2									
HCM 6th LOS			A									

# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Existing Plus Project PM Peak Hour

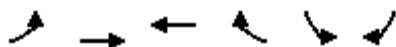







Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	5	9	0	5	9	0	5	3184	0	5	3184	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3647	0	1781	3647	0	1781	3647	0
Grp Volume(v), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	0	1781	1777	0	1781	1777	0
Q Serve(g_s), 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
Cycle Q Clear(g_c), 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
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	5	9	0	5	9	0	5	3184	0	5	3184	0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	254	3184	0	254	3184	0	254	3184	0	254	3184	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h	0		0				0		0			
Approach Delay, s/veh	0.0		0.0				0.0		0.0			
Approach LOS												
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	0.0	38.5	0.0	0.0	0.0	38.5	0.0	0.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	34.0	5.0	34.0	5.0	34.0	5.0	34.0				
Max Q Clear Time (g_c+10), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			0.0									
HCM 6th LOS			A									

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

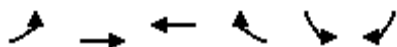
The Ranch  
Existing Plus Project PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	4	8	8	0	1625	1446
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	7294	0	1781	1585
Grp Volume(v), veh/h	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	0	1781	1585
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	4	8	8	0	1625	1446
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	1224	6205	3453	0	1625	1446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		0	0	0		
Approach Delay, s/veh		0.0	0.0	0.0		
Approach LOS						
Timer - Assigned Phs				4	6	7 8
Phs Duration (G+Y+Rc), s				0.0	45.7	0.0 0.0
Change Period (Y+Rc), s				4.5	4.5	4.5 4.5
Max Green Setting (Gmax), s				79.3	41.2	30.9 43.9
Max Q Clear Time (g_c+I1), s				0.0	0.0	0.0 0.0
Green Ext Time (p_c), s				0.0	0.0	0.0 0.0
Intersection Summary						
HCM 6th Ctrl Delay			0.0			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Existing Plus Project PM Peak Hour










Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	147	1323	0
Future Volume (veh/h)	0	0	0	147	1323	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	0	0	0	11	1438	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	316	131	131	111	2037	934
Arrive On Green	0.00	0.00	0.00	0.07	0.58	0.00
Sat Flow, veh/h	1426	1900	1900	1610	3510	1610
Grp Volume(v), veh/h	0	0	0	11	1438	0
Grp Sat Flow(s), veh/h/ln	1426	1900	1900	1610	1755	1610
Q Serve(g_s), s	0.0	0.0	0.0	0.1	6.6	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.1	6.6	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	316	131	131	111	2037	934
V/C Ratio(X)	0.00	0.00	0.00	0.10	0.71	0.00
Avail Cap(c_a), veh/h	1031	1084	1084	918	12166	5580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	10.0	3.4	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	10.1	3.6	0.0
LnGrp LOS	A	A	A	B	A	A
Approach Vol, veh/h		0	11		1438	
Approach Delay, s/veh		0.0	10.1		3.6	
Approach LOS			B		A	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		5.6			5.6	17.2
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		11.7			11.7	77.7
Max Q Clear Time (g_c+I1), s		0.0			2.1	8.6
Green Ext Time (p_c), s		0.0			0.0	3.3
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			3.6			
HCM 6th LOS			A			
<b>Notes</b>						
User approved pedestrian interval to be less than phase max green.						

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Existing Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1313	0	0	143	946	4	5	196	0	0	0
Future Volume (veh/h)	10	1313	0	0	143	946	4	5	196	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	11	1382	0	0	151	498	4	5	163			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	41	2822	0	0	744	1261	315	331	281			
Arrive On Green	0.01	0.54	0.00	0.00	0.39	0.39	0.17	0.17	0.17			
Sat Flow, veh/h	3510	5358	0	0	1900	3220	1810	1900	1610			
Grp Volume(v), veh/h	11	1382	0	0	151	498	4	5	163			
Grp Sat Flow(s),veh/h/ln	1755	1729	0	0	1900	1610	1810	1900	1610			
Q Serve(g_s), s	0.1	4.7	0.0	0.0	1.5	3.2	0.1	0.1	2.6			
Cycle Q Clear(g_c), s	0.1	4.7	0.0	0.0	1.5	3.2	0.1	0.1	2.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	41	2822	0	0	744	1261	315	331	281			
V/C Ratio(X)	0.27	0.49	0.00	0.00	0.20	0.39	0.01	0.02	0.58			
Avail Cap(c_a), veh/h	1977	13695	0	0	3679	6235	2994	3144	2664			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	13.9	4.0	0.0	0.0	5.7	6.2	9.7	9.7	10.8			
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0	0.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.2	4.1	0.0	0.0	5.8	6.3	9.7	9.7	11.5			
LnGrp LOS	B	A	A	A	A	A	A	A	B			
Approach Vol, veh/h	1393			649			172					
Approach Delay, s/veh	4.2			6.2			11.4					
Approach LOS	A			A			B					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	19.5			8.9		4.3	15.1					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	73.7			45.7		16.0	53.7					
Max Q Clear Time (g_c+l1), s	6.7			4.6		2.1	5.2					
Green Ext Time (p_c), s	7.5			0.3		0.0	1.6					

### Intersection Summary




HCM 6th Ctrl Delay	5.3
HCM 6th LOS	A

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

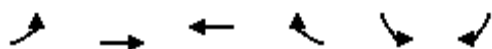
The Ranch  
Existing Plus Project PM Peak Hour

Intersection						
Int Delay, s/veh	13.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	491	51	35	401	39
Future Vol, veh/h	34	491	51	35	401	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	37	540	56	38	441	43
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1000	75	0	0	94	0
Stage 1	75	-	-	-	-	-
Stage 2	925	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	272	992	-	-	1513	-
Stage 1	953	-	-	-	-	-
Stage 2	389	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	191	992	-	-	1513	-
Mov Cap-2 Maneuver	191	-	-	-	-	-
Stage 1	953	-	-	-	-	-
Stage 2	273	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	21.5	0		7.6		
HCM LOS	C					
Minor Lane/Major Mvmt		NBT	NBRWBLn1	SBL	SBT	
Capacity (veh/h)		-	-	780	1513	-
HCM Lane V/C Ratio		-	-	0.74	0.291	-
HCM Control Delay (s)		-	-	21.5	8.4	0
HCM Lane LOS		-	-	C	A	A
HCM 95th %tile Q(veh)		-	-	6.7	1.2	-



# HCM 6th Signalized Intersection Summary 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Existing Plus Project PM Peak Hour



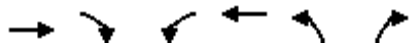
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↗↗	↗↗	↰	↰	↗↗	
Traffic Volume (veh/h)	128	1250	867	30	571	576	
Future Volume (veh/h)	128	1250	867	30	571	576	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	136	1330	922	0	607	589	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	208	1480	1142		915	1602	
Arrive On Green	0.06	0.42	0.32	0.00	0.51	0.51	
Sat Flow, veh/h	3456	3647	3647	1585	1781	2790	
Grp Volume(v), veh/h	136	1330	922	0	607	589	
Grp Sat Flow(s),veh/h/ln	1728	1777	1777	1585	1781	1395	
Q Serve(g_s), s	4.4	40.1	27.3	0.0	28.9	13.1	
Cycle Q Clear(g_c), s	4.4	40.1	27.3	0.0	28.9	13.1	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	208	1480	1142		915	1602	
V/C Ratio(X)	0.65	0.90	0.81		0.66	0.37	
Avail Cap(c_a), veh/h	361	1740	1245		915	1602	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	52.9	31.3	35.7	0.0	20.6	13.2	
Incr Delay (d2), s/veh	1.3	5.5	3.3	0.0	1.5	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.9	17.2	11.8	0.0	12.0	13.4	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	54.2	36.7	39.1	0.0	22.1	13.3	
LnGrp LOS	D	D	D		C	B	
Approach Vol, veh/h							
		1466	922	A	1196		
Approach Delay, s/veh							
		38.4	39.1		17.7		
Approach LOS							
		D	D		B		
Timer - Assigned Phs							
				4	6	7	8
Phs Duration (G+Y+Rc), s				51.9	63.1	10.9	41.0
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				55.8	50.2	11.5	39.8
Max Q Clear Time (g_c+I1), s				42.1	30.9	6.4	29.3
Green Ext Time (p_c), s				5.3	2.4	0.1	3.0
Intersection Summary							
HCM 6th Ctrl Delay			31.7				
HCM 6th LOS			C				

## Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Existing Plus Project PM Peak Hour

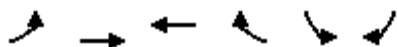







Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	1324	498	0	1182	226	65
Future Volume (veh/h)	1324	498	0	1182	226	65
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1439	330	0	1285	246	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1824	814	0	1824	1442	661
Arrive On Green	0.51	0.51	0.00	0.51	0.42	0.42
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1439	330	0	1285	246	17
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	38.1	14.7	0.0	31.7	5.1	0.7
Cycle Q Clear(g_c), s	38.1	14.7	0.0	31.7	5.1	0.7
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1824	814	0	1824	1442	661
V/C Ratio(X)	0.79	0.41	0.00	0.70	0.17	0.03
Avail Cap(c_a), veh/h	2565	1144	0	2565	1442	661
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.9	17.2	0.0	21.3	21.0	19.7
Incr Delay (d2), s/veh	1.1	0.3	0.0	0.5	0.3	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	5.6	5.3	0.0	12.2	2.1	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	24.0	17.5	0.0	21.8	21.3	19.8
LnGrp LOS	C	B	A	C	C	B
Approach Vol, veh/h	1769			1285	263	
Approach Delay, s/veh	22.8			21.8	21.2	
Approach LOS	C			C	C	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	52.0			63.0		63.0
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	23.5			82.5		82.5
Max Q Clear Time (g_c+I1), s	7.1			40.1		33.7
Green Ext Time (p_c), s	0.8			18.4		11.9
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			22.3			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Prewett Ranch Drive & Hillcrest Avenue

The Ranch  
Existing Plus Project PM Peak Hour





















Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	179	43	31	4	7	162	
Future Volume (veh/h)	179	43	31	4	7	162	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	190	46	33	4	7	172	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	257	574	131	16	940	836	
Arrive On Green	0.14	0.31	0.08	0.07	0.53	0.53	
Sat Flow, veh/h	1781	1870	1636	198	1781	1585	
Grp Volume(v), veh/h	190	46	0	37	7	172	
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1835	1781	1585	
Q Serve(g_s), s	4.9	0.8	0.0	0.9	0.1	2.8	
Cycle Q Clear(g_c), s	4.9	0.8	0.0	0.9	0.1	2.8	
Prop In Lane	1.00			0.11	1.00	1.00	
Lane Grp Cap(c), veh/h	257	574	0	147	940	836	
V/C Ratio(X)	0.74	0.08	0.00	0.25	0.01	0.21	
Avail Cap(c_a), veh/h	332	1219	0	702	940	836	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	19.8	11.9	0.0	20.9	5.4	6.0	
Incr Delay (d2), s/veh	6.2	0.1	0.0	0.9	0.0	0.6	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	2.3	0.3	0.0	0.4	0.0	0.1	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	26.0	12.0	0.0	21.8	5.4	6.6	
LnGrp LOS	C	B	A	C	A	A	
Approach Vol, veh/h		236	37		179		
Approach Delay, s/veh		23.3	21.8		6.6		
Approach LOS		C	C		A		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				18.8	29.5	11.0	7.9
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				31.0	25.0	8.5	18.0
Max Q Clear Time (g_c+I1), s				2.8	4.8	6.9	2.9
Green Ext Time (p_c), s				0.2	0.5	0.1	0.1
Intersection Summary							
HCM 6th Ctrl Delay			16.5				
HCM 6th LOS			B				
Notes							

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Existing Plus Project Mitigated AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	0	809	0	0	0	5	1423	350	158	671	0
Future Volume (veh/h)	173	0	809	0	0	0	5	1423	350	158	671	0
Initial Q (Qb), veh	0	0	60				0	60	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870				1870	1870	1870	1826	1826	0
Adj Flow Rate, veh/h	197	0	268				6	1617	363	180	762	0
Peak Hour Factor	0.88	0.88	0.88				0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	0	2				2	2	2	5	5	0
Cap, veh/h	475	0	546				66	2549	475	289	3561	0
Arrive On Green	0.13	0.00	0.13				0.52	0.53	0.52	0.09	0.70	0.00
Sat Flow, veh/h	3456	0	3614				3	4406	987	3374	5149	0
Grp Volume(v), veh/h	197	0	268				686	751	548	180	762	0
Grp Sat Flow(s),veh/h/ln	1728	0	1205				1865	1021	1489	1687	1662	0
Q Serve(g_s), s	2.8	0.0	3.8				0.0	14.9	15.0	2.8	2.9	0.0
Cycle Q Clear(g_c), s	2.8	0.0	3.8				15.0	14.9	15.0	2.8	2.9	0.0
Prop In Lane	1.00		1.00				0.01		0.66	1.00		0.00
Lane Grp Cap(c), veh/h	475	0	546				1052	1122	816	289	3561	0
V/C Ratio(X)	0.41	0.00	0.49				0.65	0.67	0.67	0.62	0.21	0.00
Avail Cap(c_a), veh/h	908	0	950				1993	2140	1561	406	6146	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.8	0.0	35.3				10.6	11.3	10.6	29.3	3.1	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.3				0.3	0.3	0.4	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	171.2				4.2	15.6	7.4	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	12.0				7.2	6.4	6.6	1.3	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.0	0.0	206.7				15.0	27.1	18.4	30.1	3.1	0.0
LnGrp LOS	C	A	F				B	C	B	C	A	A
Approach Vol, veh/h		465						1986			942	
Approach Delay, s/veh		130.2						20.5			8.2	
Approach LOS		F						C			A	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	9.4	32.9		11.7		42.3						
Change Period (Y+Rc), s	4.9	* 4.9		5.3		4.9						
Max Green Setting (Gmax), s	6.0	* 56		13.7		66.1						
Max Q Clear Time (g_c+I1), s	4.8	17.0		5.8		4.9						
Green Ext Time (p_c), s	0.0	10.9		0.7		3.4						

### Intersection Summary

HCM 6th Ctrl Delay	32.2
HCM 6th LOS	C

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 22: Deer Valley Road & Balfour Road

The Ranch  
Existing Plus Project Mitigated AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	79	382	27	30	473	48
Future Volume (veh/h)	79	382	27	30	473	48
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	84	80	29	15	503	51
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	118	113	596	308	909	64
Arrive On Green	0.14	0.14	0.51	0.51	0.51	0.51
Sat Flow, veh/h	869	828	1180	610	1257	127
Grp Volume(v), veh/h	165	0	0	44	554	0
Grp Sat Flow(s),veh/h/ln	1708	0	0	1790	1384	0
Q Serve(g_s), s	2.3	0.0	0.0	0.3	8.1	0.0
Cycle Q Clear(g_c), s	2.3	0.0	0.0	0.3	8.5	0.0
Prop In Lane	0.51	0.48		0.34	0.91	
Lane Grp Cap(c), veh/h	233	0	0	904	973	0
V/C Ratio(X)	0.71	0.00	0.00	0.05	0.57	0.00
Avail Cap(c_a), veh/h	1225	0	0	1284	1275	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.4	0.0	0.0	3.2	5.3	0.0
Incr Delay (d2), s/veh	4.0	0.0	0.0	0.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	0.0	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.3	0.0	0.0	3.2	5.8	0.0
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	165		44		554	
Approach Delay, s/veh	14.3		3.2		5.8	
Approach LOS	B		A		A	
Timer - Assigned Phs	2		6		8	
Phs Duration (G+Y+Rc), s	17.2		17.2		7.9	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	18.0		18.0		18.0	
Max Q Clear Time (g_c+I1), s	2.3		10.5		4.3	
Green Ext Time (p_c), s	0.1		2.2		0.4	

### Intersection Summary

HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A


















### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Existing Plus Project Mitigated PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	0	1389	0	0	0	14	1189	439	333	839	0
Future Volume (veh/h)	305	0	1389	0	0	0	14	1189	439	333	839	0
Initial Q (Qb), veh	0	0	20				0	20	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1885	0	1885				1885	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	311	0	983				14	1213	391	340	856	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	0	1				1	1	1	1	1	0
Cap, veh/h	1049	0	1002				55	1709	492	396	3076	0
Arrive On Green	0.31	0.00	0.31				0.38	0.39	0.38	0.12	0.58	0.00
Sat Flow, veh/h	3483	0	3643				17	4071	1299	3483	5316	0
Grp Volume(v), veh/h	311	0	983				557	617	444	340	856	0
Grp Sat Flow(s),veh/h/ln	1742	0	1214				1853	1029	1476	1742	1716	0
Q Serve(g_s), s	5.0	0.0	19.0				1.4	19.4	19.6	7.1	6.3	0.0
Cycle Q Clear(g_c), s	5.0	0.0	19.0				19.3	19.4	19.6	7.1	6.3	0.0
Prop In Lane	1.00		1.00				0.03		0.88	1.00		0.00
Lane Grp Cap(c), veh/h	1049	0	1002				768	832	595	396	3076	0
V/C Ratio(X)	0.30	0.00	0.98				0.73	0.74	0.75	0.86	0.28	0.00
Avail Cap(c_a), veh/h	1163	0	1216				1105	1209	867	419	3916	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.5	0.0	32.9				19.8	20.0	20.2	34.8	7.7	0.0
Incr Delay (d2), s/veh	0.1	0.0	18.8				0.5	0.6	0.9	14.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	63.4				1.1	4.0	2.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	14.4				8.3	5.1	6.8	3.8	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	0.0	115.2				21.4	24.6	23.1	49.4	7.7	0.0
LnGrp LOS	C	A	F				C	C	C	D	A	A
Approach Vol, veh/h		1294						1618			1196	
Approach Delay, s/veh		92.7						23.1			19.6	
Approach LOS		F						C			B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	13.9	33.6		27.4		47.5						
Change Period (Y+Rc), s	4.9	* 4.9		5.3		4.9						
Max Green Setting (Gmax), s	9.0	* 43		23.7		56.1						
Max Q Clear Time (g_c+I1), s	9.1	21.6		21.0		8.3						
Green Ext Time (p_c), s	0.0	7.0		1.1		3.9						

### Intersection Summary

HCM 6th Ctrl Delay	44.0
HCM 6th LOS	D

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 22: Deer Valley Road & Balfour Road

The Ranch  
Existing Plus Project Mitigated PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	34	491	51	35	401	39
Future Volume (veh/h)	34	491	51	35	401	39
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	37	92	56	17	441	43
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	58	145	675	205	883	68
Arrive On Green	0.12	0.12	0.48	0.48	0.48	0.48
Sat Flow, veh/h	474	1178	1399	425	1204	140
Grp Volume(v), veh/h	130	0	0	73	484	0
Grp Sat Flow(s),veh/h/ln	1664	0	0	1824	1345	0
Q Serve(g_s), s	1.7	0.0	0.0	0.5	6.3	0.0
Cycle Q Clear(g_c), s	1.7	0.0	0.0	0.5	6.8	0.0
Prop In Lane	0.28	0.71		0.23	0.91	
Lane Grp Cap(c), veh/h	205	0	0	880	950	0
V/C Ratio(X)	0.63	0.00	0.00	0.08	0.51	0.00
Avail Cap(c_a), veh/h	1313	0	0	1439	1375	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.5	0.0	0.0	3.2	4.9	0.0
Incr Delay (d2), s/veh	3.2	0.0	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	0.0	0.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.8	0.0	0.0	3.2	5.4	0.0
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	130		73		484	
Approach Delay, s/veh	12.8		3.2		5.4	
Approach LOS	B		A		A	
Timer - Assigned Phs	2		6		8	
Phs Duration (G+Y+Rc), s	15.5		15.5		7.3	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	18.0		18.0		18.0	
Max Q Clear Time (g_c+I1), s	2.5		8.8		3.7	
Green Ext Time (p_c), s	0.2		2.2		0.3	

### Intersection Summary

HCM 6th Ctrl Delay	6.5
HCM 6th LOS	A

### Notes



















User approved volume balancing among the lanes for turning movement.



# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Near Term AM Peak Hour







												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	240	0	300	1000	810	0	0	690	440
Future Volume (veh/h)	0	0	0	240	0	300	1000	810	0	0	690	440
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				282	0	212	1176	953	0	0	812	159
Peak Hour Factor				0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %				1	0	1	2	2	0	0	2	2
Cap, veh/h				662	0	303	1338	2424	0	0	1487	363
Arrive On Green				0.19	0.00	0.19	0.39	0.68	0.00	0.00	0.23	0.23
Sat Flow, veh/h				3483	0	1598	3456	3647	0	0	6696	1571
Grp Volume(v), veh/h				282	0	212	1176	953	0	0	812	159
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1728	1777	0	0	1609	1571
Q Serve(g_s), s				4.5	0.0	7.8	19.8	7.3	0.0	0.0	6.9	5.4
Cycle Q Clear(g_c), s				4.5	0.0	7.8	19.8	7.3	0.0	0.0	6.9	5.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				662	0	303	1338	2424	0	0	1487	363
V/C Ratio(X)				0.43	0.00	0.70	0.88	0.39	0.00	0.00	0.55	0.44
Avail Cap(c_a), veh/h				2393	0	1098	2485	5054	0	0	4113	1004
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				22.3	0.0	23.7	17.8	4.3	0.0	0.0	21.2	20.6
Incr Delay (d2), s/veh				0.2	0.0	1.1	0.8	0.0	0.0	0.0	0.1	0.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.6	0.0	2.7	6.5	1.3	0.0	0.0	2.3	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				22.5	0.0	24.8	18.6	4.4	0.0	0.0	21.3	20.9
LnGrp LOS				C	A	C	B	A	A	A	C	C
Approach Vol, veh/h					494			2129			971	
Approach Delay, s/veh					23.5			12.2			21.2	
Approach LOS					C			B			C	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	46.7			28.2			18.5			15.9		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	9.3			21.8			8.9			9.8		
Green Ext Time (p_c), s	4.4			2.4			3.8			0.8		
Intersection Summary												
HCM 6th Ctrl Delay	16.2											
HCM 6th LOS	B											

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	370	0	580	0	0	0	0	1450	200	290	660	0
Future Volume (veh/h)	370	0	580	0	0	0	0	1450	200	290	660	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1885	1885	1870	1870	0
Adj Flow Rate, veh/h	430	0	674				0	1686	213	337	767	0
Peak Hour Factor	0.86	0.86	0.86				0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3				0	1	1	2	2	0
Cap, veh/h	1040	0	926				0	2412	305	441	2047	0
Arrive On Green	0.29	0.00	0.29				0.00	0.41	0.39	0.13	0.58	0.00
Sat Flow, veh/h	3534	0	3145				0	6136	742	3456	3647	0
Grp Volume(v), veh/h	430	0	674				0	1396	503	337	767	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1621	1750	1728	1777	0
Q Serve(g_s), s	7.0	0.0	13.8				0.0	17.0	17.1	6.8	8.4	0.0
Cycle Q Clear(g_c), s	7.0	0.0	13.8				0.0	17.0	17.1	6.8	8.4	0.0
Prop In Lane	1.00		1.00				0.00		0.42	1.00		0.00
Lane Grp Cap(c), veh/h	1040	0	926				0	1998	719	441	2047	0
V/C Ratio(X)	0.41	0.00	0.73				0.00	0.70	0.70	0.76	0.37	0.00
Avail Cap(c_a), veh/h	3397	0	3023				0	2845	1024	818	3118	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.3	0.0	22.7				0.0	17.5	17.7	30.3	8.2	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.1				0.0	0.2	0.5	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	4.7				0.0	5.4	6.0	2.6	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.6	0.0	23.9				0.0	17.7	18.2	31.3	8.3	0.0
LnGrp LOS	C	A	C				A	B	B	C	A	A
Approach Vol, veh/h	1104						1899			1104		
Approach Delay, s/veh	22.6						17.8			15.3		
Approach LOS	C						B			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	33.2	33.5	25.1		46.7							
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	40.7	40.7	68.5		* 63							
Max Q Clear Time (g_c+I), s	19.1	19.1	15.8		10.4							
Green Ext Time (p_c), s	0.4	9.1	4.8		3.4							

### Intersection Summary

HCM 6th Ctrl Delay	18.4
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Near Term AM Peak Hour



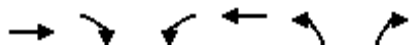
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	→	↱	↰	→	↱	↰	↑↑	↱↱	↰	↑↑	↱
Traffic Volume (veh/h)	20	0	90	460	80	110	240	490	980	30	620	30
Future Volume (veh/h)	20	0	90	460	80	110	240	490	980	30	620	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1841	1841	1841	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	24	0	0	541	94	70	282	576	415	35	729	30
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	8	8	4	4	4	2	2	2	5	5	5
Cap, veh/h	38	63	0	763	164	122	342	1488	1150	136	1035	43
Arrive On Green	0.02	0.00	0.00	0.15	0.17	0.16	0.19	0.42	0.42	0.08	0.30	0.29
Sat Flow, veh/h	1697	1781	0	4944	980	730	1781	3554	2745	1739	3395	140
Grp Volume(v), veh/h	24	0	0	541	0	164	282	576	415	35	372	387
Grp Sat Flow(s), veh/h/ln	1697	1781	0	1648	0	1709	1781	1777	1373	1739	1735	1800
Q Serve(g_s), s	0.7	0.0	0.0	5.3	0.0	4.5	7.8	5.7	5.3	1.0	9.7	9.7
Cycle Q Clear(g_c), s	0.7	0.0	0.0	5.3	0.0	4.5	7.8	5.7	5.3	1.0	9.7	9.7
Prop In Lane	1.00		0.00	1.00		0.43	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	38	63	0	763	0	286	342	1488	1150	136	529	549
V/C Ratio(X)	0.63	0.00	0.00	0.71	0.00	0.57	0.82	0.39	0.36	0.26	0.70	0.70
Avail Cap(c_a), veh/h	166	1036	0	1161	0	1228	593	3359	2595	136	1198	1244
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	0.0	0.0	20.5	0.0	19.7	19.8	10.3	10.2	22.1	15.7	15.8
Incr Delay (d2), s/veh	6.1	0.0	0.0	0.5	0.0	0.7	1.9	0.1	0.1	0.4	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.7	0.0	1.6	2.8	1.6	1.2	0.4	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	0.0	0.0	21.0	0.0	20.4	21.7	10.4	10.2	22.5	16.4	16.4
LnGrp LOS	C	A	A	C	A	C	C	B	B	C	B	B
Approach Vol, veh/h	24				705				1273			
Approach Delay, s/veh	30.8				20.8				12.8			
Approach LOS	C				C				B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	25.4	11.9	5.8	13.8	19.6	5.2	12.5				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	47.4	12.0	29.1	17.0	34.4	5.0	36.1				
Max Q Clear Time (g_c+13), s	4.0	7.7	7.3	0.0	9.8	11.7	2.7	6.5				
Green Ext Time (p_c), s	0.0	3.4	0.6	0.0	0.2	2.6	0.0	0.5				

### Intersection Summary

HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Near Term AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	250	750	60	300	340	180
Future Volume (veh/h)	250	750	60	300	340	180
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1366	1366	1856	1856
Adj Flow Rate, veh/h	269	261	65	323	366	39
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	36	36	3	3
Cap, veh/h	1084	478	223	730	631	289
Arrive On Green	0.31	0.31	0.09	0.53	0.18	0.18
Sat Flow, veh/h	3647	1567	2525	1366	3428	1572
Grp Volume(v), veh/h	269	261	65	323	366	39
Grp Sat Flow(s), veh/h/ln	1777	1567	1262	1366	1714	1572
Q Serve(g_s), s	1.6	3.9	0.7	4.1	2.8	0.6
Cycle Q Clear(g_c), s	1.6	3.9	0.7	4.1	2.8	0.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1084	478	223	730	631	289
V/C Ratio(X)	0.25	0.55	0.29	0.44	0.58	0.13
Avail Cap(c_a), veh/h	6761	2981	498	3062	2222	1019
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.4	8.2	12.1	4.0	10.6	9.7
Incr Delay (d2), s/veh	0.0	0.4	0.7	0.2	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.6	0.1	0.1	0.8	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.5	8.6	12.8	4.2	10.9	9.8
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	530			388	405	
Approach Delay, s/veh	8.0			5.6	10.8	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		9.2	6.5	12.7		19.2
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		18.4	5.1	53.4		63.0
Max Q Clear Time (g_c+I1), s		4.8	2.7	5.9		6.1
Green Ext Time (p_c), s		0.7	0.0	1.4		1.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			8.2			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱		↰↱↰↱					↰↱↰↱		↰↱	↰↱↰↱	
Traffic Volume (veh/h)	180	20	860	0	0	0	10	1490	370	170	700	0
Future Volume (veh/h)	180	20	860	0	0	0	10	1490	370	170	700	0
Initial Q (Qb), veh	0	0	60				0	60	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				1870	1870	1870	1826	1826	0
Adj Flow Rate, veh/h	205	23	380				11	1693	383	193	795	0
Peak Hour Factor	0.88	0.88	0.88				0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2				2	2	2	5	5	0
Cap, veh/h	577	0	608				60	2603	488	280	3610	0
Arrive On Green	0.17	0.17	0.17				0.54	0.54	0.52	0.09	0.70	0.00
Sat Flow, veh/h	3456	0	3614				9	4401	991	3374	5149	0
Grp Volume(v), veh/h	205	0	380				717	789	581	193	795	0
Grp Sat Flow(s), veh/h/ln	1728	0	1205				1855	1021	1503	1687	1662	0
Q Serve(g_s), s	3.3	0.0	6.1				0.0	18.0	18.2	3.4	3.5	0.0
Cycle Q Clear(g_c), s	3.3	0.0	6.1				17.8	18.0	18.2	3.4	3.5	0.0
Prop In Lane	1.00		1.00				0.02		0.66	1.00		0.00
Lane Grp Cap(c), veh/h	577	0	608				1078	1147	840	280	3610	0
V/C Ratio(X)	0.36	0.00	0.63				0.67	0.69	0.69	0.69	0.22	0.00
Avail Cap(c_a), veh/h	1002	0	1048				2072	2237	1646	652	3773	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.0	0.0	44.5				11.9	12.8	12.1	35.2	3.4	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.4				0.3	0.3	0.4	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	186.5				4.2	15.8	7.4	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	15.7				8.9	7.8	8.3	1.7	0.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.2	0.0	231.4				16.3	28.9	19.9	36.4	3.4	0.0
LnGrp LOS	C	A	F				B	C	B	D	A	A
Approach Vol, veh/h		585						2087			988	
Approach Delay, s/veh		160.6						22.1			9.9	
Approach LOS		F						C			A	
Timer - Assigned Phs	1	2		4			6					
Phs Duration (G+Y+Rc), s	37.5			14.3			47.8					
Change Period (Y+Rc), s	4.9	* 4.9		5.3			4.9					
Max Green Setting (Gmax), s	2.0	* 67		16.7			46.1					
Max Q Clear Time (g_c+I), s	20.2			8.1			5.5					
Green Ext Time (p_c), s	0.2	12.3		0.9			3.6					

### Intersection Summary

HCM 6th Ctrl Delay 40.9  
HCM 6th LOS D

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Contra Loma Plaza/Davison Drive

The Ranch  
Near Term AM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	↰
Traffic Volume (veh/h)	30	20	20	200	30	240	20	1280	120	170	870	20
Future Volume (veh/h)	30	20	20	200	30	240	20	1280	120	170	870	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	23	0	227	34	13	23	1455	133	193	989	22
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	1	1	1	2	2	2	2	2	2
Cap, veh/h	68	46	99	286	300	254	35	1692	154	275	2037	45
Arrive On Green	0.06	0.06	0.00	0.16	0.16	0.16	0.02	0.51	0.51	0.08	0.57	0.57
Sat Flow, veh/h	1075	727	1572	1795	1885	1595	1781	3293	299	3456	3552	79
Grp Volume(v), veh/h	57	0	0	227	34	13	23	781	807	193	495	516
Grp Sat Flow(s),veh/h/ln	1802	0	1572	1795	1885	1595	1781	1777	1815	1728	1777	1854
Q Serve(g_s), s	2.7	0.0	0.0	10.5	1.3	0.6	1.1	33.0	33.7	4.7	14.3	14.3
Cycle Q Clear(g_c), s	2.7	0.0	0.0	10.5	1.3	0.6	1.1	33.0	33.7	4.7	14.3	14.3
Prop In Lane	0.60		1.00	1.00		1.00	1.00		0.16	1.00		0.04
Lane Grp Cap(c), veh/h	113	0	99	286	300	254	35	913	933	275	1019	1063
V/C Ratio(X)	0.50	0.00	0.00	0.79	0.11	0.05	0.66	0.86	0.87	0.70	0.49	0.49
Avail Cap(c_a), veh/h	728	0	635	788	827	700	329	1539	1572	638	1539	1605
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	0.0	0.0	35.0	31.2	30.9	42.2	18.3	18.5	38.9	10.9	10.9
Incr Delay (d2), s/veh	1.3	0.0	0.0	1.9	0.1	0.0	7.6	1.1	1.3	1.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	4.5	0.6	0.2	0.5	11.6	12.2	2.0	5.1	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	0.0	0.0	36.9	31.2	30.9	49.7	19.4	19.8	40.1	11.1	11.1
LnGrp LOS	D	A	A	D	C	C	D	B	B	D	B	B
Approach Vol, veh/h	57			274			1611			1204		
Approach Delay, s/veh	40.6			35.9			20.0			15.7		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	48.5			9.4	5.7	53.7		17.8				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	74.4			35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+10), s	35.7			4.7	3.1	16.3		12.5				
Green Ext Time (p_c), s	0.2	8.1		0.1	0.0	4.9		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	20.1											
HCM 6th LOS	C											

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	130	70	70	140	700	70	680	20	510	860	130
Future Volume (veh/h)	150	130	70	70	140	700	70	680	20	510	860	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	169	146	25	79	157	787	79	764	21	573	966	70
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	2	2	2
Cap, veh/h	203	985	165	102	958	1273	189	942	26	662	1201	694
Arrive On Green	0.11	0.32	0.32	0.06	0.27	0.26	0.11	0.26	0.25	0.19	0.34	0.32
Sat Flow, veh/h	1781	3037	509	1795	3582	2812	1795	3559	98	3456	3554	1582
Grp Volume(v), veh/h	169	84	87	79	157	787	79	384	401	573	966	70
Grp Sat Flow(s),veh/h/ln	1781	1777	1769	1795	1791	1406	1795	1791	1866	1728	1777	1582
Q Serve(g_s), s	9.1	3.3	3.4	4.3	3.3	20.9	4.0	19.8	19.8	15.8	24.3	1.4
Cycle Q Clear(g_c), s	9.1	3.3	3.4	4.3	3.3	20.9	4.0	19.8	19.8	15.8	24.3	1.4
Prop In Lane	1.00		0.29	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	203	576	574	102	958	1273	189	474	494	662	1201	694
V/C Ratio(X)	0.83	0.15	0.15	0.78	0.16	0.62	0.42	0.81	0.81	0.87	0.80	0.10
Avail Cap(c_a), veh/h	417	1337	1331	183	2222	2266	201	874	911	1125	2494	1270
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.7	23.5	23.7	45.8	27.6	20.4	41.2	33.9	33.9	38.5	29.6	6.2
Incr Delay (d2), s/veh	3.4	0.0	0.0	4.7	0.0	0.2	0.5	1.3	1.2	1.7	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	1.3	1.4	2.0	1.4	6.3	1.8	8.3	8.6	6.7	10.2	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.1	23.6	23.7	50.5	27.6	20.6	41.7	35.1	35.1	40.2	30.1	6.2
LnGrp LOS	D	C	C	D	C	C	D	D	D	D	C	A
Approach Vol, veh/h	340			1023			864			1609		
Approach Delay, s/veh	34.8			24.0			35.7			32.6		
Approach LOS	C			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.8	30.0	9.6	35.9	15.6	37.2	15.2	30.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	32.0	46.7	10.0	73.4	11.0	* 68	23.0	60.4				
Max Q Clear Time (g_c+I1), s	11.8	21.8	6.3	5.4	6.0	26.3	11.1	22.9				
Green Ext Time (p_c), s	1.0	2.7	0.0	0.5	0.0	5.5	0.2	2.5				

### Intersection Summary

HCM 6th Ctrl Delay	31.2
HCM 6th LOS	C

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	60	610	10	100	60	800	1270	10	70	810	160
Future Volume (veh/h)	170	60	610	10	100	60	800	1270	10	70	810	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	116	139	85	10	101	8	808	1283	5	71	818	141
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	2	2	2
Cap, veh/h	214	225	381	15	155	142	940	1828	797	91	1233	211
Arrive On Green	0.12	0.12	0.12	0.09	0.09	0.09	0.27	0.51	0.51	0.05	0.28	0.27
Sat Flow, veh/h	1795	1885	3195	168	1694	1552	3483	3582	1561	1781	4373	748
Grp Volume(v), veh/h	116	139	85	111	0	8	808	1283	5	71	635	324
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1862	0	1552	1742	1791	1561	1781	1702	1718
Q Serve(g_s), s	4.3	4.9	1.7	4.0	0.0	0.3	15.5	19.2	0.1	2.8	11.6	11.7
Cycle Q Clear(g_c), s	4.3	4.9	1.7	4.0	0.0	0.3	15.5	19.2	0.1	2.8	11.6	11.7
Prop In Lane	1.00		1.00	0.09		1.00	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	214	225	381	170	0	142	940	1828	797	91	959	484
V/C Ratio(X)	0.54	0.62	0.22	0.65	0.00	0.06	0.86	0.70	0.01	0.78	0.66	0.67
Avail Cap(c_a), veh/h	460	483	819	1035	0	862	1638	2858	1246	279	1649	832
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.1	29.4	28.0	30.8	0.0	29.1	24.4	13.1	8.4	32.9	22.3	22.4
Incr Delay (d2), s/veh	0.8	1.0	0.1	1.6	0.0	0.1	0.9	0.2	0.0	5.3	0.3	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	2.1	0.6	1.7	0.0	0.1	5.7	6.0	0.0	1.3	4.4	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.9	30.4	28.1	32.4	0.0	29.2	25.3	13.3	8.4	38.2	22.5	23.0
LnGrp LOS	C	C	C	C	A	C	C	B	A	D	C	C
Approach Vol, veh/h	340			119			2096			1030		
Approach Delay, s/veh	29.7			32.2			17.9			23.8		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	39.8		12.4	22.9	24.5		10.4				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	1.0	54.7		17.1	33.0	* 33		39.0				
Max Q Clear Time (g_c+14.8)	21.2			6.9	17.5	13.7		6.0				
Green Ext Time (p_c), s	0.0	6.6		0.6	1.5	4.4		0.3				

### Intersection Summary

HCM 6th Ctrl Delay	21.2
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↑↑ ↱			↰ ↑↑ ↱			↰ ↱		↑	↱	↰ ↱	↱
Traffic Volume (veh/h)	50	840	200	190	1180	70	330	150	180	70	180	120
Future Volume (veh/h)	50	840	200	190	1180	70	330	150	180	70	180	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	57	966	119	218	1356	27	379	172	46	80	207	117
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	73	1249	153	255	1925	38	462	672	556	103	315	178
Arrive On Green	0.04	0.27	0.27	0.14	0.37	0.37	0.13	0.36	0.36	0.06	0.28	0.27
Sat Flow, veh/h	1795	4633	569	1795	5191	103	3483	1885	1559	1810	1123	635
Grp Volume(v), veh/h	57	715	370	218	896	487	379	172	46	80	0	324
Grp Sat Flow(s),veh/h/ln	1795	1716	1771	1795	1716	1864	1742	1885	1559	1810	0	1757
Q Serve(g_s), s	2.9	17.6	17.7	10.9	20.4	20.4	9.7	5.9	1.8	4.0	0.0	14.9
Cycle Q Clear(g_c), s	2.9	17.6	17.7	10.9	20.4	20.4	9.7	5.9	1.8	4.0	0.0	14.9
Prop In Lane	1.00		0.32	1.00		0.06	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	73	925	477	255	1272	691	462	672	556	103	0	494
V/C Ratio(X)	0.78	0.77	0.78	0.85	0.70	0.70	0.82	0.26	0.08	0.77	0.00	0.66
Avail Cap(c_a), veh/h	176	1551	801	471	2113	1148	723	980	810	217	0	760
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	43.5	30.9	30.9	38.3	24.5	24.5	38.6	20.9	19.5	42.6	0.0	29.2
Incr Delay (d2), s/veh	6.4	0.5	1.0	3.2	0.3	0.5	2.2	0.1	0.0	4.6	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	6.8	7.2	4.8	7.6	8.3	4.1	2.4	0.6	1.8	0.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.9	31.4	32.0	41.5	24.8	25.0	40.8	20.9	19.6	47.1	0.0	29.8
LnGrp LOS	D	C	C	D	C	C	D	C	B	D	A	C
Approach Vol, veh/h	1142					1601		597		404		
Approach Delay, s/veh	32.5					27.2		33.5		33.2		
Approach LOS	C					C		C		C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	36.6	17.0	28.7	16.1	29.7	7.7	37.9				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax),s	1.0	46.3	24.0	* 41	19.0	38.3	9.0	* 56				
Max Q Clear Time (g_c+10),s	1.0	7.9	12.9	19.7	11.7	16.9	4.9	22.4				
Green Ext Time (p_c), s	0.0	0.6	0.2	4.4	0.4	1.1	0.0	6.4				

### Intersection Summary

HCM 6th Ctrl Delay	30.4
HCM 6th LOS	C





















### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Near Term AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	680	320	240	930	290	340	300	110	340	540	20
Future Volume (veh/h)	30	680	320	240	930	290	340	300	110	340	540	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	35	791	95	279	1081	118	395	349	95	395	628	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	44	1279	152	312	1992	217	467	719	193	468	917	31
Arrive On Green	0.02	0.28	0.26	0.18	0.43	0.41	0.13	0.26	0.25	0.13	0.26	0.25
Sat Flow, veh/h	1795	4628	551	1781	4666	509	3483	2776	744	3483	3532	118
Grp Volume(v), veh/h	35	585	301	279	788	411	395	223	221	395	318	331
Grp Sat Flow(s),veh/h/ln	1795	1716	1748	1781	1702	1770	1742	1791	1729	1742	1791	1859
Q Serve(g_s), s	2.0	15.3	15.6	15.8	17.8	17.9	11.4	10.9	11.2	11.4	16.5	16.6
Cycle Q Clear(g_c), s	2.0	15.3	15.6	15.8	17.8	17.9	11.4	10.9	11.2	11.4	16.5	16.6
Prop In Lane	1.00		0.32	1.00		0.29	1.00		0.43	1.00		0.06
Lane Grp Cap(c), veh/h	44	948	483	312	1453	756	467	464	448	468	465	483
V/C Ratio(X)	0.79	0.62	0.62	0.89	0.54	0.54	0.85	0.48	0.49	0.84	0.68	0.69
Avail Cap(c_a), veh/h	104	1263	643	466	1945	1012	641	676	653	675	694	720
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.1	32.6	32.9	41.7	22.1	22.2	43.7	32.4	32.7	43.6	34.4	34.5
Incr Delay (d2), s/veh	11.2	0.2	0.5	10.5	0.1	0.2	5.8	0.3	0.3	4.6	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	6.1	6.4	7.6	6.6	7.0	5.1	4.5	4.5	5.0	6.9	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.3	32.8	33.4	52.2	22.2	22.5	49.4	32.7	33.1	48.3	35.1	35.1
LnGrp LOS	E	C	C	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		921			1478			839			1044	
Approach Delay, s/veh		34.1			27.9			40.7			40.1	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.9	30.8	22.1	32.5	17.8	30.8	6.5	48.1				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+I1), s	13.4	13.2	17.8	17.6	13.4	18.6	4.0	19.9				
Green Ext Time (p_c), s	0.4	1.5	0.3	3.3	0.4	2.1	0.0	5.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			34.7									
HCM 6th LOS			C									

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱ ↲ ↳			↰ ↱ ↲ ↳			↰ ↱ ↲ ↳			↰ ↱ ↲ ↳		
Traffic Volume (veh/h)	170	590	70	60	1050	170	220	90	40	350	100	230
Future Volume (veh/h)	170	590	70	60	1050	170	220	90	40	350	100	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	191	663	25	67	1180	55	247	101	5	393	112	145
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	179	2097	79	85	1851	572	181	525	26	409	601	262
Arrive On Green	0.10	0.42	0.39	0.05	0.36	0.36	0.10	0.15	0.13	0.12	0.17	0.17
Sat Flow, veh/h	1781	5047	190	1781	5106	1578	1795	3474	171	3483	3582	1564
Grp Volume(v), veh/h	191	446	242	67	1180	55	247	52	54	393	112	145
Grp Sat Flow(s),veh/h/ln	1781	1702	1833	1781	1702	1578	1795	1791	1854	1742	1791	1564
Q Serve(g_s), s	6.0	5.3	5.3	2.2	11.4	1.4	6.0	1.5	1.5	6.7	1.6	5.1
Cycle Q Clear(g_c), s	6.0	5.3	5.3	2.2	11.4	1.4	6.0	1.5	1.5	6.7	1.6	5.1
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	179	1415	762	85	1851	572	181	270	280	409	601	262
V/C Ratio(X)	1.07	0.32	0.32	0.79	0.64	0.10	1.37	0.19	0.19	0.96	0.19	0.55
Avail Cap(c_a), veh/h	179	2644	1424	179	3966	1226	181	1343	1390	409	2746	1199
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.8	11.7	11.8	28.1	15.8	12.6	26.8	22.1	22.2	26.2	21.3	22.7
Incr Delay (d2), s/veh	85.6	0.0	0.1	6.1	0.1	0.0	196.2	0.1	0.1	34.1	0.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	1.6	1.7	1.0	3.6	0.4	12.1	0.6	0.6	4.4	0.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	112.4	11.8	11.9	34.2	15.9	12.6	223.0	22.2	22.3	60.3	21.4	23.4
LnGrp LOS	F	B	B	C	B	B	F	C	C	E	C	C
Approach Vol, veh/h	879		1302				353			650		
Approach Delay, s/veh	33.6		16.7				162.7			45.3		
Approach LOS	C		B				F			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	13.0	6.8	28.8	10.0	14.0	10.0	25.6				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	43.4	6.0	45.0	6.0	44.4	6.0	45.0				
Max Q Clear Time (g_c+1/3), s	3.5	3.5	4.2	7.3	8.0	7.1	8.0	13.4				
Green Ext Time (p_c), s	0.0	0.3	0.0	2.6	0.0	0.6	0.0	5.8				
Intersection Summary												
HCM 6th Ctrl Delay			43.4									
HCM 6th LOS			D									

# HCM 6th Signalized Intersection Summary 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1120	490	160	1380	0	0	0	0	420	0	620
Future Volume (veh/h)	0	1120	490	160	1380	0	0	0	0	420	0	620
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1217	137	174	1500	0				457	0	645
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	1	1	0				2	2	2
Cap, veh/h	0	1623	503	214	2411	0				1577	0	702
Arrive On Green	0.00	0.32	0.32	0.11	0.47	0.00				0.44	0.00	0.44
Sat Flow, veh/h	0	5316	1596	1975	5316	0				3563	0	1585
Grp Volume(v), veh/h	0	1217	137	174	1500	0				457	0	645
Grp Sat Flow(s),veh/h/ln	0	1716	1596	987	1716	0				1781	0	1585
Q Serve(g_s), s	0.0	19.1	5.8	7.7	19.7	0.0				7.4	0.0	34.4
Cycle Q Clear(g_c), s	0.0	19.1	5.8	7.7	19.7	0.0				7.4	0.0	34.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1623	503	214	2411	0				1577	0	702
V/C Ratio(X)	0.00	0.75	0.27	0.81	0.62	0.00				0.29	0.00	0.92
Avail Cap(c_a), veh/h	0	2634	817	352	3779	0				2616	0	1164
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	27.6	23.0	39.2	17.9	0.0				16.0	0.0	23.5
Incr Delay (d2), s/veh	0.0	0.3	0.1	2.8	0.1	0.0				0.0	0.0	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.2	2.0	1.9	6.9	0.0				2.7	0.0	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	27.9	23.2	42.0	18.0	0.0				16.1	0.0	28.2
LnGrp LOS	A	C	C	D	B	A				B	A	C
Approach Vol, veh/h		1354			1674						1102	
Approach Delay, s/veh		27.4			20.5						23.2	
Approach LOS		C			C						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	3.8	32.3		43.8		46.1						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	6.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+19.7), s	19.7	21.1		36.4		21.7						
Green Ext Time (p_c), s	0.1	5.9		2.1		8.3						

## Intersection Summary

HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

## Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↑	↑	↑↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1110	420	150	940	530	610	30	280	0	0	0
Future Volume (veh/h)	0	1110	420	150	940	530	610	30	280	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	0	1207	141	163	1022	304	687	0	139			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2			
Cap, veh/h	0	1980	614	208	2960	894	961	0	427			
Arrive On Green	0.00	0.39	0.39	0.12	0.58	0.58	0.27	0.00	0.27			
Sat Flow, veh/h	0	5274	1583	1781	5106	1542	3563	0	1583			
Grp Volume(v), veh/h	0	1207	141	163	1022	304	687	0	139			
Grp Sat Flow(s),veh/h/ln	0	1702	1583	1781	1702	1542	1781	0	1583			
Q Serve(g_s), s	0.0	10.1	3.2	4.7	5.6	5.5	9.3	0.0	3.7			
Cycle Q Clear(g_c), s	0.0	10.1	3.2	4.7	5.6	5.5	9.3	0.0	3.7			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	1980	614	208	2960	894	961	0	427			
V/C Ratio(X)	0.00	0.61	0.23	0.79	0.35	0.34	0.72	0.00	0.33			
Avail Cap(c_a), veh/h	0	4616	1431	369	6059	1829	3288	0	1461			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	13.0	10.9	22.8	5.9	5.8	17.5	0.0	15.5			
Incr Delay (d2), s/veh	0.0	0.1	0.1	2.5	0.0	0.1	0.4	0.0	0.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	2.9	0.9	1.8	1.1	1.0	3.1	0.0	1.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	13.1	11.0	25.3	5.9	5.9	17.9	0.0	15.7			
LnGrp LOS	A	B	B	C	A	A	B	A	B			
Approach Vol, veh/h	1348		1489			826						
Approach Delay, s/veh	12.9		8.0			17.5						
Approach LOS	B		A			B						
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	0.2	24.6	18.3		34.8							
Change Period (Y+Rc), s	4.0	5.3	5.3		5.3							
Max Green Setting (Gmax), s	1.0	46.7	47.7		61.7							
Max Q Clear Time (g_c+I10), s	1.0	12.1	11.3		7.6							
Green Ext Time (p_c), s	0.1	6.2	1.5		5.5							

### Intersection Summary

HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

### Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road

The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	90	10	10	60	340	10	140	10	250	100	20
Future Volume (veh/h)	40	90	10	10	60	340	10	140	10	250	100	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.95	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	48	107	8	12	71	228	12	167	6	298	119	9
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	134	450	34	133	99	318	135	562	20	363	967	72
Arrive On Green	0.08	0.26	0.26	0.08	0.26	0.26	0.08	0.16	0.14	0.20	0.29	0.26
Sat Flow, veh/h	1781	1716	128	1767	379	1216	1795	3520	126	1795	3373	252
Grp Volume(v), veh/h	48	0	115	12	0	299	12	85	88	298	63	65
Grp Sat Flow(s),veh/h/ln	1781	0	1845	1767	0	1594	1795	1791	1855	1795	1791	1835
Q Serve(g_s), s	1.4	0.0	2.6	0.3	0.0	9.1	0.3	2.2	2.2	8.4	1.4	1.4
Cycle Q Clear(g_c), s	1.4	0.0	2.6	0.3	0.0	9.1	0.3	2.2	2.2	8.4	1.4	1.4
Prop In Lane	1.00		0.07	1.00		0.76	1.00		0.07	1.00		0.14
Lane Grp Cap(c), veh/h	134	0	483	133	0	418	135	286	296	363	513	526
V/C Ratio(X)	0.36	0.00	0.24	0.09	0.00	0.72	0.09	0.30	0.30	0.82	0.12	0.12
Avail Cap(c_a), veh/h	369	0	1249	366	0	1080	709	1718	1780	709	1718	1760
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	0.0	15.4	22.9	0.0	17.8	22.9	19.7	19.8	20.3	14.0	14.1
Incr Delay (d2), s/veh	0.6	0.0	0.1	0.1	0.0	0.9	0.1	0.2	0.2	1.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.9	0.1	0.0	2.8	0.1	0.8	0.8	3.1	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.0	0.0	15.5	23.0	0.0	18.7	23.0	19.9	20.0	22.1	14.1	14.1
LnGrp LOS	C	A	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	163			311			185			426		
Approach Delay, s/veh	18.0			18.9			20.1			19.7		
Approach LOS	B			B			C			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.7	12.5	8.0	17.9	8.0	19.2	8.0	17.9				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	11.0	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+I10), s	4.2	4.2	2.3	4.6	2.3	3.4	3.4	11.1				
Green Ext Time (p_c), s	0.3	0.5	0.0	0.3	0.0	0.4	0.0	1.1				

### Intersection Summary

HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B











# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	180	180	230	170	150	100	510	120	140	880	60
Future Volume (veh/h)	120	180	180	230	170	150	100	510	120	140	880	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	132	198	164	253	187	135	110	560	113	154	967	62
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	165	226	187	290	310	224	139	924	186	188	1155	74
Arrive On Green	0.09	0.24	0.24	0.16	0.31	0.31	0.08	0.31	0.30	0.10	0.34	0.32
Sat Flow, veh/h	1795	946	784	1781	1001	722	1795	2968	597	1795	3411	219
Grp Volume(v), veh/h	132	0	362	253	0	322	110	337	336	154	508	521
Grp Sat Flow(s),veh/h/ln	1795	0	1730	1781	0	1723	1795	1791	1774	1795	1791	1839
Q Serve(g_s), s	6.3	0.0	17.7	12.2	0.0	13.9	5.3	14.0	14.2	7.4	23.0	23.0
Cycle Q Clear(g_c), s	6.3	0.0	17.7	12.2	0.0	13.9	5.3	14.0	14.2	7.4	23.0	23.0
Prop In Lane	1.00		0.45	1.00		0.42	1.00		0.34	1.00		0.12
Lane Grp Cap(c), veh/h	165	0	413	290	0	534	139	557	552	188	606	623
V/C Ratio(X)	0.80	0.00	0.88	0.87	0.00	0.60	0.79	0.60	0.61	0.82	0.84	0.84
Avail Cap(c_a), veh/h	307	0	670	406	0	765	184	775	767	245	836	858
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.1	0.0	32.2	35.9	0.0	25.7	39.8	25.7	25.9	38.5	26.8	26.9
Incr Delay (d2), s/veh	3.4	0.0	4.4	10.9	0.0	0.4	11.3	0.4	0.4	11.9	4.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	7.4	5.8	0.0	5.3	2.7	5.6	5.6	3.7	9.6	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.5	0.0	36.6	46.7	0.0	26.1	51.2	26.1	26.3	50.4	30.8	30.8
LnGrp LOS	D	A	D	D	A	C	D	C	C	D	C	C
Approach Vol, veh/h	494					575		783		1183		
Approach Delay, s/veh	38.2					35.2		29.7		33.4		
Approach LOS	D					D		C		C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	31.2	31.3	18.3	25.0	10.8	33.7	12.1	31.2				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	36.7	36.7	20.0	34.0	9.0	39.7	15.0	39.0				
Max Q Clear Time (g_c+19.4)	16.2	16.2	14.2	19.7	7.3	25.0	8.3	15.9				
Green Ext Time (p_c), s	0.0	2.3	0.2	1.1	0.0	3.4	0.1	1.1				

### Intersection Summary

HCM 6th Ctrl Delay	33.6
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Near Term AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	60	720	40	330	990
Future Volume (veh/h)	20	60	720	40	330	990
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.97	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1885	1885	1885	1885
Adj Flow Rate, veh/h	23	0	828	20	379	1138
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	41	37	1376	598	469	2707
Arrive On Green	0.02	0.00	0.38	0.38	0.26	0.76
Sat Flow, veh/h	1810	1610	3676	1556	1795	3676
Grp Volume(v), veh/h	23	0	828	20	379	1138
Grp Sat Flow(s), veh/h/ln	1810	1610	1791	1556	1795	1791
Q Serve(g_s), s	0.5	0.0	6.7	0.3	7.1	4.1
Cycle Q Clear(g_c), s	0.5	0.0	6.7	0.3	7.1	4.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	41	37	1376	598	469	2707
V/C Ratio(X)	0.56	0.00	0.60	0.03	0.81	0.42
Avail Cap(c_a), veh/h	1702	1515	4063	1765	1639	7730
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.5	0.0	8.9	6.9	12.5	1.6
Incr Delay (d2), s/veh	4.3	0.0	0.2	0.0	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.4	0.1	2.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.8	0.0	9.1	7.0	13.8	1.6
LnGrp LOS	C	A	A	A	B	A
Approach Vol, veh/h	23		848		1517	
Approach Delay, s/veh	21.8		9.0		4.7	
Approach LOS	C		A		A	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	3.4	17.9			31.3	4.8
Change Period (Y+Rc), s	4.0	5.3			5.3	4.0
Max Green Setting (Gmax), s	33.0	39.7			76.7	34.0
Max Q Clear Time (g_c+19, s)	19.6	8.7			6.1	2.5
Green Ext Time (p_c), s	0.5	3.6			5.7	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			6.4			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary 17: Deer Valley Road & Sand Creek Road

The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↗	↕		↗	↕		↗	↕	
Traffic Volume (veh/h)	0	0	0	90	0	350	0	360	50	420	480	0
Future Volume (veh/h)	0	0	0	90	0	350	0	360	50	420	480	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	0	0	0	111	0	9	0	444	47	519	593	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	0	168	0	351	158	141	5	825	87	608	2496	0
Arrive On Green	0.00	0.00	0.00	0.09	0.00	0.09	0.00	0.25	0.22	0.34	0.70	0.00
Sat Flow, veh/h	0	1900	0	1789	1791	1593	1810	3287	346	1795	3676	0
Grp Volume(v), veh/h	0	0	0	111	0	9	0	243	248	519	593	0
Grp Sat Flow(s),veh/h/ln	0	1900	0	1789	1791	1593	1810	1805	1829	1795	1791	0
Q Serve(g_s), s	0.0	0.0	0.0	2.2	0.0	0.2	0.0	4.3	4.4	10.0	2.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.2	0.0	0.2	0.0	4.3	4.4	10.0	2.2	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.19	1.00		0.00
Lane Grp Cap(c), veh/h	0	168	0	351	158	141	5	453	459	608	2496	0
V/C Ratio(X)	0.00	0.00	0.00	0.32	0.00	0.06	0.00	0.54	0.54	0.85	0.24	0.00
Avail Cap(c_a), veh/h	0	1785	0	1874	1682	1497	534	3488	3534	1012	7883	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	16.5	0.0	15.6	0.0	12.1	12.2	11.5	2.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.4	0.4	1.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.7	0.0	0.1	0.0	1.2	1.3	3.2	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	16.7	0.0	15.6	0.0	12.4	12.6	13.2	2.1	0.0
LnGrp LOS	A	A	A	B	A	B	A	B	B	B	A	A
Approach Vol, veh/h	0			120			491			1112		
Approach Delay, s/veh	0.0			16.6			12.5			7.3		
Approach LOS				B			B			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	13.4		7.3	0.0	30.0		7.3				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	1.0	70.7		35.0	11.0	80.7		35.0				
Max Q Clear Time (g_c+11.0), s	1.0	6.4		0.0	0.0	4.2		4.2				
Green Ext Time (p_c), s	0.6	1.7		0.0	0.0	3.0		0.1				

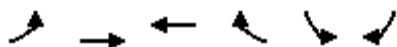
## Intersection Summary

HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A

# HCM 6th Signalized Intersection Summary

## 18: Sand Creek Road & Hillcrest Avenue

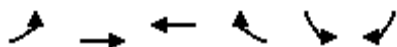
The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	60	50	60	240	10
Future Volume (veh/h)	0	60	50	60	240	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	65	54	1	261	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	509	598	600	11	475	422
Arrive On Green	0.00	0.17	0.17	0.13	0.27	0.27
Sat Flow, veh/h	1349	3647	3663	66	1781	1585
Grp Volume(v), veh/h	0	65	27	28	261	9
Grp Sat Flow(s), veh/h/ln	1349	1777	1777	1858	1781	1585
Q Serve(g_s), s	0.0	0.2	0.2	0.2	1.8	0.1
Cycle Q Clear(g_c), s	0.0	0.2	0.2	0.2	1.8	0.1
Prop In Lane	1.00			0.04	1.00	1.00
Lane Grp Cap(c), veh/h	509	598	299	313	475	422
V/C Ratio(X)	0.00	0.11	0.09	0.09	0.55	0.02
Avail Cap(c_a), veh/h	3580	8690	4345	4544	4708	4189
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	5.0	5.0	5.0	4.5	3.8
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.1	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	5.1	5.1	5.1	5.5	3.8
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		65	55		270	
Approach Delay, s/veh		5.1	5.1		5.4	
Approach LOS		A	A		A	
Timer - Assigned Phs				4	6	8
Phs Duration (G+Y+Rc), s				6.4	7.8	6.4
Change Period (Y+Rc), s				4.5	4.5	4.5
Max Green Setting (Gmax), s				34.1	36.9	34.1
Max Q Clear Time (g_c+I1), s				2.2	3.8	2.2
Green Ext Time (p_c), s				0.3	0.8	0.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			5.3			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary 19: Sand Creek Road & Heidorn Ranch Road

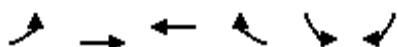
The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	300	100	130	200	10
Future Volume (veh/h)	0	300	100	130	200	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	326	109	16	217	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	3	575	504	73	1253	1115
Arrive On Green	0.00	0.16	0.16	0.15	0.70	0.70
Sat Flow, veh/h	1781	3647	3211	449	1781	1585
Grp Volume(v), veh/h	0	326	61	64	217	8
Grp Sat Flow(s), veh/h/ln	1781	1777	1777	1790	1781	1585
Q Serve(g_s), s	0.0	5.0	1.8	1.8	2.4	0.1
Cycle Q Clear(g_c), s	0.0	5.0	1.8	1.8	2.4	0.1
Prop In Lane	1.00			0.25	1.00	1.00
Lane Grp Cap(c), veh/h	3	575	288	290	1253	1115
V/C Ratio(X)	0.00	0.57	0.21	0.22	0.17	0.01
Avail Cap(c_a), veh/h	943	4783	1331	1340	1253	1115
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	22.9	21.6	21.7	3.0	2.6
Incr Delay (d2), s/veh	0.0	0.9	0.4	0.4	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.9	0.7	0.7	0.4	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	23.8	21.9	22.0	3.3	2.6
LnGrp LOS	A	C	C	C	A	A
Approach Vol, veh/h		326	125		225	
Approach Delay, s/veh		23.8	22.0		3.3	
Approach LOS		C	C		A	
Timer - Assigned Phs			4		6	7 8
Phs Duration (G+Y+Rc), s			13.6		45.7	0.0 13.6
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			79.3		41.2	30.9 43.9
Max Q Clear Time (g_c+I1), s			7.0		4.4	0.0 3.8
Green Ext Time (p_c), s			2.1		0.6	0.0 0.6
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			16.6			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Near Term AM Peak Hour










Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	220	330	160	370	810	30
Future Volume (veh/h)	220	330	160	370	810	30
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	259	388	188	126	953	9
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	563	775	775	657	1301	597
Arrive On Green	0.41	0.41	0.41	0.41	0.37	0.37
Sat Flow, veh/h	1066	1870	1870	1585	3483	1598
Grp Volume(v), veh/h	259	388	188	126	953	9
Grp Sat Flow(s), veh/h/ln	1066	1870	1870	1585	1742	1598
Q Serve(g_s), s	7.9	5.8	2.5	1.9	8.9	0.1
Cycle Q Clear(g_c), s	10.4	5.8	2.5	1.9	8.9	0.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	563	775	775	657	1301	597
V/C Ratio(X)	0.46	0.50	0.24	0.19	0.73	0.02
Avail Cap(c_a), veh/h	1703	2776	2776	2353	3323	1524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.6	8.2	7.2	7.0	10.2	7.4
Incr Delay (d2), s/veh	0.2	0.2	0.1	0.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.3	0.5	0.4	2.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.8	8.3	7.2	7.1	10.5	7.5
LnGrp LOS	B	A	A	A	B	A
Approach Vol, veh/h		647	314		962	
Approach Delay, s/veh		9.3	7.2		10.5	
Approach LOS		A	A		B	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		19.6			19.6	18.1
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		54.7			54.7	34.7
Max Q Clear Time (g_c+I1), s		12.4			4.5	10.9
Green Ext Time (p_c), s		2.0			0.8	1.9
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			9.5			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	1020	0	0	370	1040	110	0	160	0	0	0
Future Volume (veh/h)	160	1020	0	0	370	1040	110	0	160	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	165	1052	0	0	381	719	113	0	78			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	337	3108	0	0	718	1217	508	0	226			
Arrive On Green	0.10	0.60	0.00	0.00	0.38	0.38	0.14	0.00	0.14			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	165	1052	0	0	381	719	113	0	78			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	1.4	3.2	0.0	0.0	5.0	5.7	0.9	0.0	1.4			
Cycle Q Clear(g_c), s	1.4	3.2	0.0	0.0	5.0	5.7	0.9	0.0	1.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	337	3108	0	0	718	1217	508	0	226			
V/C Ratio(X)	0.49	0.34	0.00	0.00	0.53	0.59	0.22	0.00	0.35			
Avail Cap(c_a), veh/h	1758	12179	0	0	3272	5545	5241	0	2332			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	13.6	3.1	0.0	0.0	7.6	7.8	12.0	0.0	12.2			
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.0	0.2	0.2	0.1	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.0	1.0	0.9	0.2	0.0	1.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.0	3.1	0.0	0.0	7.8	8.0	12.1	0.0	12.6			
LnGrp LOS	B	A	A	A	A	A	B	A	B			
Approach Vol, veh/h	1217			1100			191					
Approach Delay, s/veh	4.6			7.9			12.3					
Approach LOS	A			A			B					
Timer - Assigned Phs	2		4		5	6						
Phs Duration (G+Y+Rc), s	23.1		8.6		7.1	16.1						
Change Period (Y+Rc), s	5.3		5.3		4.0	5.3						
Max Green Setting (Gmax), s	73.7		45.7		16.0	53.7						
Max Q Clear Time (g_c+l1), s	5.2		3.4		3.4	7.7						
Green Ext Time (p_c), s	5.1		0.3		0.2	3.1						

### Intersection Summary

HCM 6th Ctrl Delay	6.7
HCM 6th LOS	A




### Notes

User approved volume balancing among the lanes for turning movement.



HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Near Term AM Peak Hour

Intersection						
Int Delay, s/veh	17.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	360	40	30	390	100
Future Vol, veh/h	80	360	40	30	390	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	85	383	43	32	415	106
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	995	59	0	0	75	0
Stage 1	59	-	-	-	-	-
Stage 2	936	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	274	1012	-	-	1537	-
Stage 1	969	-	-	-	-	-
Stage 2	385	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	195	1012	-	-	1537	-
Mov Cap-2 Maneuver	195	-	-	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	275	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	33.2	0		6.5		
HCM LOS	D					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	574		1537	-	
HCM Lane V/C Ratio	-	0.815		0.27	-	
HCM Control Delay (s)	-	33.2		8.2	0	
HCM Lane LOS	-	D		A	A	
HCM 95th %tile Q(veh)	-	8.2		1.1	-	

# HCM 6th Signalized Intersection Summary 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Near Term AM Peak Hour



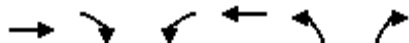
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↰↰↰	↰	↰	↰↰	
Traffic Volume (veh/h)	200	1260	740	80	380	790	
Future Volume (veh/h)	200	1260	740	80	380	790	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1870	1870	1796	1796	
Adj Flow Rate, veh/h	217	1370	804	0	413	534	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	1	1	2	2	7	7	
Cap, veh/h	276	1527	1581		853	1336	
Arrive On Green	0.08	0.43	0.31	0.00	0.50	0.50	
Sat Flow, veh/h	3483	3676	5274	1585	1711	2679	
Grp Volume(v), veh/h	217	1370	804	0	413	534	
Grp Sat Flow(s),veh/h/ln	1742	1791	1702	1585	1711	1340	
Q Serve(g_s), s	7.3	42.6	15.5	0.0	19.1	15.0	
Cycle Q Clear(g_c), s	7.3	42.6	15.5	0.0	19.1	15.0	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	276	1527	1581		853	1336	
V/C Ratio(X)	0.79	0.90	0.51		0.48	0.40	
Avail Cap(c_a), veh/h	421	1955	1979		853	1336	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	54.3	32.0	33.9	0.0	19.9	18.8	
Incr Delay (d2), s/veh	2.6	4.2	0.1	0.0	0.2	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.2	18.2	6.2	0.0	7.6	13.4	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	56.8	36.2	34.0	0.0	20.0	18.9	
LnGrp LOS	E	D	C		C	B	
Approach Vol, veh/h							
		1587	804	A	947		
Approach Delay, s/veh							
		39.0	34.0		19.4		
Approach LOS							
		D	C		B		
Timer - Assigned Phs							
				4	6	7	8
Phs Duration (G+Y+Rc), s				55.7	64.3	14.0	41.6
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				65.5	45.5	14.5	46.5
Max Q Clear Time (g_c+I1), s				44.6	21.1	9.3	17.5
Green Ext Time (p_c), s				6.5	1.9	0.2	3.5
Intersection Summary							
HCM 6th Ctrl Delay			32.3				
HCM 6th LOS			C				

## Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Near Term AM Peak Hour














Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑	↘↘	↗
Traffic Volume (veh/h)	1010	630	0	1380	100	20
Future Volume (veh/h)	1010	630	0	1380	100	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1098	386	0	1500	109	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1799	802	0	1799	1476	677
Arrive On Green	0.51	0.51	0.00	0.51	0.43	0.43
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1098	386	0	1500	109	6
Grp Sat Flow(s),veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	26.5	19.1	0.0	43.3	2.2	0.3
Cycle Q Clear(g_c), s	26.5	19.1	0.0	43.3	2.2	0.3
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1799	802	0	1799	1476	677
V/C Ratio(X)	0.61	0.48	0.00	0.83	0.07	0.01
Avail Cap(c_a), veh/h	2636	1176	0	2636	1476	677
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.2	19.3	0.0	25.3	20.3	19.8
Incr Delay (d2), s/veh	0.3	0.4	0.0	1.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	7.0	0.0	17.1	0.9	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.5	19.8	0.0	26.9	20.4	19.8
LnGrp LOS	C	B	A	C	C	B
Approach Vol, veh/h	1484			1500	115	
Approach Delay, s/veh	21.1			26.9	20.4	
Approach LOS	C			C	C	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	55.3		64.7		64.7	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	22.5		88.5		88.5	
Max Q Clear Time (g_c+I1), s	4.2		28.5		45.3	
Green Ext Time (p_c), s	0.3		13.8		14.9	
Intersection Summary						
HCM 6th Ctrl Delay			23.9			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Near Term AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	40	50	0	40	10	20	240	0	10	110	150
Future Volume (veh/h)	200	40	50	0	40	10	20	240	0	10	110	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	233	47	58	0	47	12	23	279	0	12	128	174
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	285	760	644	5	186	48	77	760	339	54	714	318
Arrive On Green	0.16	0.41	0.41	0.00	0.13	0.12	0.04	0.21	0.00	0.03	0.20	0.20
Sat Flow, veh/h	1781	1870	1585	1781	1437	367	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	233	47	58	0	0	59	23	279	0	12	128	174
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1804	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.3	0.5	0.8	0.0	0.0	1.0	0.4	2.3	0.0	0.2	1.0	3.4
Cycle Q Clear(g_c), s	4.3	0.5	0.8	0.0	0.0	1.0	0.4	2.3	0.0	0.2	1.0	3.4
Prop In Lane	1.00		1.00	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	285	760	644	5	0	234	77	760	339	54	714	318
V/C Ratio(X)	0.82	0.06	0.09	0.00	0.00	0.25	0.30	0.37	0.00	0.22	0.18	0.55
Avail Cap(c_a), veh/h	285	1008	854	285	0	972	285	2018	900	285	2018	900
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.9	6.2	6.3	0.0	0.0	13.5	15.9	11.5	0.0	16.3	11.4	12.3
Incr Delay (d2), s/veh	16.7	0.0	0.1	0.0	0.0	0.6	2.1	0.3	0.0	2.0	0.1	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.1	0.2	0.0	0.0	0.4	0.2	0.6	0.0	0.1	0.3	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.6	6.2	6.3	0.0	0.0	14.0	18.1	11.8	0.0	18.3	11.5	13.8
LnGrp LOS	C	A	A	A	A	B	B	B	A	B	B	B
Approach Vol, veh/h	338			59			302			314		
Approach Delay, s/veh	23.0			14.0			12.3			13.0		
Approach LOS	C			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.0	11.3	0.0	18.0	5.5	10.9	9.5	8.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+1/2), s	4.3	4.3	0.0	2.8	2.4	5.4	6.3	3.0				
Green Ext Time (p_c), s	0.0	1.3	0.0	0.3	0.0	1.0	0.0	0.2				



















### Intersection Summary

HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Near Term PM Peak Hour








												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	200	0	240	710	770	0	0	610	440
Future Volume (veh/h)	0	0	0	200	0	240	710	770	0	0	610	440
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				204	0	68	724	786	0	0	622	120
Peak Hour Factor				0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %				1	0	1	1	1	0	0	1	1
Cap, veh/h				512	0	235	974	2281	0	0	1617	397
Arrive On Green				0.15	0.00	0.15	0.28	0.64	0.00	0.00	0.25	0.25
Sat Flow, veh/h				3483	0	1598	3483	3676	0	0	6749	1591
Grp Volume(v), veh/h				204	0	68	724	786	0	0	622	120
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1742	1791	0	0	1621	1591
Q Serve(g_s), s				2.0	0.0	1.4	7.0	3.8	0.0	0.0	2.9	2.3
Cycle Q Clear(g_c), s				2.0	0.0	1.4	7.0	3.8	0.0	0.0	2.9	2.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				512	0	235	974	2281	0	0	1617	397
V/C Ratio(X)				0.40	0.00	0.29	0.74	0.34	0.00	0.00	0.38	0.30
Avail Cap(c_a), veh/h				4044	0	1855	4232	8607	0	0	7004	1718
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				14.3	0.0	14.1	12.1	3.1	0.0	0.0	11.5	11.3
Incr Delay (d2), s/veh				0.2	0.0	0.3	0.4	0.0	0.0	0.0	0.1	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.6	0.0	0.4	1.8	0.1	0.0	0.0	0.7	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				14.5	0.0	14.3	12.6	3.2	0.0	0.0	11.6	11.4
LnGrp LOS				B	A	B	B	A	A	A	B	B
Approach Vol, veh/h					272			1510			742	
Approach Delay, s/veh					14.5			7.7			11.6	
Approach LOS					B			A			B	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	27.6			14.4			13.2			9.4		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	5.8			9.0			4.9			4.0		
Green Ext Time (p_c), s	3.5			1.4			2.8			0.5		
Intersection Summary												
HCM 6th Ctrl Delay	9.5											
HCM 6th LOS	A											

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	480	0	950	0	0	0	0	1000	270	280	600	0
Future Volume (veh/h)	480	0	950	0	0	0	0	1000	270	280	600	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	500	0	990				0	1042	245	292	625	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1477	0	1314				0	1579	367	397	1619	0
Arrive On Green	0.41	0.00	0.41				0.00	0.30	0.28	0.11	0.45	0.00
Sat Flow, veh/h	3591	0	3195				0	5558	1229	3483	3676	0
Grp Volume(v), veh/h	500	0	990				0	956	331	292	625	0
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1621	1659	1742	1791	0
Q Serve(g_s), s	6.5	0.0	18.0				0.0	11.7	12.0	5.5	7.9	0.0
Cycle Q Clear(g_c), s	6.5	0.0	18.0				0.0	11.7	12.0	5.5	7.9	0.0
Prop In Lane	1.00		1.00				0.00		0.74	1.00		0.00
Lane Grp Cap(c), veh/h	1477	0	1314				0	1450	495	397	1619	0
V/C Ratio(X)	0.34	0.00	0.75				0.00	0.66	0.67	0.74	0.39	0.00
Avail Cap(c_a), veh/h	4491	0	3996				0	2147	732	666	2477	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.7	0.0	17.1				0.0	20.8	21.4	29.1	12.4	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.9				0.0	0.2	0.6	1.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	5.6				0.0	3.9	4.2	2.2	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.8	0.0	18.0				0.0	21.0	21.9	30.1	12.4	0.0
LnGrp LOS	B	A	B				A	C	C	C	B	A
Approach Vol, veh/h	1490						1287			917		
Approach Delay, s/veh	16.6						21.3			18.1		
Approach LOS	B						C			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	1.7	24.3	32.0	36.0								
Change Period (Y+Rc), s	4.0	5.3	4.5	* 5.3								
Max Green Setting (Gmax), s	3.0	28.7	84.5	* 47								
Max Q Clear Time (g_c+I1), s	17.5	14.0	20.0	9.9								
Green Ext Time (p_c), s	0.3	4.9	7.5	2.6								

### Intersection Summary

HCM 6th Ctrl Delay 18.6  
HCM 6th LOS B

### Notes

User approved volume balancing among the lanes for turning movement.
















\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Near Term PM Peak Hour



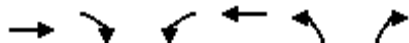
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	  		 	
Traffic Volume (veh/h)	30	20	110	830	100	170	170	580	890	50	550	30
Future Volume (veh/h)	30	20	110	830	100	170	170	580	890	50	550	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	21	14	856	103	135	175	598	302	52	567	28
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	50	92	61	1137	211	276	225	1048	811	139	850	42
Arrive On Green	0.03	0.09	0.08	0.23	0.29	0.28	0.13	0.29	0.29	0.08	0.25	0.23
Sat Flow, veh/h	1781	1040	693	5023	734	963	1781	3554	2751	1781	3447	170
Grp Volume(v), veh/h	31	0	35	856	0	238	175	598	302	52	292	303
Grp Sat Flow(s),veh/h/ln	1781	0	1733	1674	0	1697	1781	1777	1376	1781	1777	1840
Q Serve(g_s), s	0.9	0.0	1.0	8.1	0.0	6.0	4.9	7.3	4.5	1.4	7.6	7.6
Cycle Q Clear(g_c), s	0.9	0.0	1.0	8.1	0.0	6.0	4.9	7.3	4.5	1.4	7.6	7.6
Prop In Lane	1.00		0.40	1.00		0.57	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	50	0	154	1137	0	487	225	1048	811	139	438	454
V/C Ratio(X)	0.62	0.00	0.23	0.75	0.00	0.49	0.78	0.57	0.37	0.37	0.67	0.67
Avail Cap(c_a), veh/h	347	0	1116	1959	0	1423	799	4644	3595	139	1663	1722
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.7	0.0	21.8	18.5	0.0	15.3	21.7	15.3	14.3	22.4	17.4	17.5
Incr Delay (d2), s/veh	4.7	0.0	0.3	0.4	0.0	0.3	2.2	0.2	0.1	0.6	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.4	2.6	0.0	1.9	1.9	2.4	1.1	0.5	2.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	0.0	22.1	18.9	0.0	15.6	23.9	15.5	14.4	23.1	18.1	18.1
LnGrp LOS	C	A	C	B	A	B	C	B	B	C	B	B
Approach Vol, veh/h	66		1094			1075			647			
Approach Delay, s/veh	25.5		18.2			16.6			18.5			
Approach LOS	C		B			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	19.1	15.6	8.5	10.5	16.6	5.4	18.7				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	66.1	20.0	32.4	23.0	47.1	10.0	42.4				
Max Q Clear Time (g_c+I), s	13.4	9.3	10.1	3.0	6.9	9.6	2.9	8.0				
Green Ext Time (p_c), s	0.0	3.2	1.5	0.1	0.2	2.0	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			17.8									
HCM 6th LOS			B									



# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Near Term PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵↵	↑	↵↵	↑
Traffic Volume (veh/h)	250	690	50	510	530	120
Future Volume (veh/h)	250	690	50	510	530	120
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	260	252	52	531	552	30
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	1002	443	255	908	826	379
Arrive On Green	0.29	0.29	0.07	0.49	0.24	0.24
Sat Flow, veh/h	3589	1546	3401	1841	3401	1560
Grp Volume(v), veh/h	260	252	52	531	552	30
Grp Sat Flow(s), veh/h/ln	1749	1546	1700	1841	1700	1560
Q Serve(g_s), s	1.7	4.2	0.4	6.2	4.5	0.5
Cycle Q Clear(g_c), s	1.7	4.2	0.4	6.2	4.5	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1002	443	255	908	826	379
V/C Ratio(X)	0.26	0.57	0.20	0.58	0.67	0.08
Avail Cap(c_a), veh/h	4034	1783	628	2705	1950	894
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.3	9.2	13.2	5.5	10.4	8.9
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.8	0.1	0.6	1.2	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.4	9.7	13.6	5.7	10.7	8.9
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	512			583	582	
Approach Delay, s/veh	9.0			6.4	10.6	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		11.4	6.3	12.7		19.0
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		17.4	5.1	34.4		44.0
Max Q Clear Time (g_c+I1), s		6.5	2.4	6.2		8.2
Green Ext Time (p_c), s		1.0	0.0	1.4		1.9
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			8.7			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	🔴🔴		🔴🔴🔴					🔴🔴🔴		🔴🔴	🔴🔴🔴	
Traffic Volume (veh/h)	320	30	1470	0	0	0	30	1240	450	350	870	0
Future Volume (veh/h)	320	30	1470	0	0	0	30	1240	450	350	870	0
Initial Q (Qb), veh	0	0	20				0	20	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No					No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				1885	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	327	31	1081				31	1265	408	357	888	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1				1	1	1	1	1	0
Cap, veh/h	947	0	697				65	1766	516	438	3317	0
Arrive On Green	0.30	0.30	0.30				0.42	0.42	0.41	0.13	0.60	0.00
Sat Flow, veh/h	3483	0	3643				53	3994	1274	3483	5316	0
Grp Volume(v), veh/h	327	0	1081				571	658	475	357	888	0
Grp Sat Flow(s),veh/h/ln	1742	0	1214				1779	1029	1483	1742	1716	0
Q Serve(g_s), s	6.2	0.0	25.1				7.7	23.4	23.6	8.5	7.1	0.0
Cycle Q Clear(g_c), s	6.2	0.0	25.1				22.8	23.4	23.6	8.5	7.1	0.0
Prop In Lane	1.00		1.00				0.05		0.86	1.00		0.00
Lane Grp Cap(c), veh/h	947	0	697				797	883	632	438	3317	0
V/C Ratio(X)	0.35	0.00	1.55				0.72	0.75	0.75	0.82	0.27	0.00
Avail Cap(c_a), veh/h	1060	0	1108				1689	1951	1405	856	4877	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.3	0.0	55.0				21.2	21.8	22.0	42.7	7.3	0.0
Incr Delay (d2), s/veh	0.1	0.0	255.0				0.5	0.5	0.7	1.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	103.3				1.0	3.6	1.8	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	30.9				9.7	6.4	8.6	4.2	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.4	0.0	413.3				22.7	25.9	24.5	44.1	7.3	0.0
LnGrp LOS	C	A	F				C	C	C	D	A	A
Approach Vol, veh/h		1408						1704			1245	
Approach Delay, s/veh		324.4						24.5			17.9	
Approach LOS		F						C			B	
Timer - Assigned Phs	1	2		4			6					
Phs Duration (G+Y+Rc), s	5.9	39.6		30.0			55.5					
Change Period (Y+Rc), s	4.9	* 4.9		5.3			4.9					
Max Green Setting (Gmax), s	1.0	* 80		24.7			80.1					
Max Q Clear Time (g_c+I10), s	10.5	25.6		27.1			9.1					
Green Ext Time (p_c), s	0.5	9.0		0.0			4.1					

### Intersection Summary

HCM 6th Ctrl Delay 119.5  
HCM 6th LOS F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Contra Loma Plaza/Davison Drive

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	↰
Traffic Volume (veh/h)	60	50	60	160	30	130	60	890	140	200	1170	30
Future Volume (veh/h)	60	50	60	160	30	130	60	890	140	200	1170	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	61	51	7	163	31	21	61	908	136	204	1194	30
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	105	88	165	245	257	218	77	1219	183	320	1570	39
Arrive On Green	0.10	0.10	0.10	0.14	0.14	0.14	0.04	0.39	0.38	0.09	0.44	0.43
Sat Flow, veh/h	1000	836	1575	1795	1885	1594	1795	3118	467	3483	3570	90
Grp Volume(v), veh/h	112	0	7	163	31	21	61	522	522	204	599	625
Grp Sat Flow(s), veh/h/ln	1835	0	1575	1795	1885	1594	1795	1791	1794	1742	1791	1869
Q Serve(g_s), s	3.4	0.0	0.2	5.0	0.8	0.7	2.0	14.5	14.6	3.3	16.3	16.4
Cycle Q Clear(g_c), s	3.4	0.0	0.2	5.0	0.8	0.7	2.0	14.5	14.6	3.3	16.3	16.4
Prop In Lane	0.54		1.00	1.00		1.00	1.00		0.26	1.00		0.05
Lane Grp Cap(c), veh/h	192	0	165	245	257	218	77	700	701	320	788	822
V/C Ratio(X)	0.58	0.00	0.04	0.66	0.12	0.10	0.79	0.74	0.75	0.64	0.76	0.76
Avail Cap(c_a), veh/h	1107	0	950	1176	1234	1044	495	2314	2318	960	2314	2415
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	0.0	23.4	23.8	22.0	21.9	27.5	15.2	15.3	25.4	13.7	13.7
Incr Delay (d2), s/veh	1.0	0.0	0.0	1.2	0.1	0.1	6.5	0.6	0.6	0.8	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.1	1.9	0.3	0.2	0.9	4.7	4.8	1.3	5.7	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	0.0	23.4	25.0	22.1	22.0	34.0	15.8	15.9	26.2	14.3	14.3
LnGrp LOS	C	A	C	C	C	C	C	B	B	C	B	B
Approach Vol, veh/h	119			215			1105			1428		
Approach Delay, s/veh	25.7			24.2			16.8			16.0		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	26.7		10.1	6.5	29.5		11.9				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+15), s	15.3	16.6		5.4	4.0	18.4		7.0				
Green Ext Time (p_c), s	0.3	4.2		0.3	0.0	6.5		0.3				

### Intersection Summary











HCM 6th Ctrl Delay	17.3
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	190	110	70	110	640	120	790	60	900	980	170
Future Volume (veh/h)	170	190	110	70	110	640	120	790	60	900	980	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	175	196	55	72	113	660	124	814	59	928	1010	94
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	204	738	202	92	728	1302	354	954	69	922	1211	697
Arrive On Green	0.11	0.27	0.26	0.05	0.20	0.20	0.20	0.28	0.27	0.26	0.34	0.33
Sat Flow, veh/h	1795	2779	760	1795	3582	2812	1795	3385	245	3483	3582	1576
Grp Volume(v), veh/h	175	124	127	72	113	660	124	431	442	928	1010	94
Grp Sat Flow(s),veh/h/ln	1795	1791	1748	1795	1791	1406	1795	1791	1840	1742	1791	1576
Q Serve(g_s), s	11.2	6.4	6.7	4.6	3.0	19.3	7.0	26.6	26.6	31.0	30.4	1.8
Cycle Q Clear(g_c), s	11.2	6.4	6.7	4.6	3.0	19.3	7.0	26.6	26.6	31.0	30.4	1.8
Prop In Lane	1.00		0.43	1.00		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	204	476	464	92	728	1302	354	505	518	922	1211	697
V/C Ratio(X)	0.86	0.26	0.27	0.78	0.16	0.51	0.35	0.85	0.85	1.01	0.83	0.13
Avail Cap(c_a), veh/h	337	1101	1075	169	1865	2194	354	764	785	922	2141	1106
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.0	34.0	34.2	54.9	38.4	22.1	40.6	39.8	39.9	43.1	35.7	7.2
Incr Delay (d2), s/veh	5.6	0.1	0.1	5.3	0.0	0.1	0.2	3.9	3.8	31.3	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	2.7	2.8	2.2	1.3	6.0	3.0	11.8	12.1	17.2	13.2	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.6	34.1	34.3	60.2	38.4	22.2	40.8	43.6	43.6	74.4	36.3	7.2
LnGrp LOS	E	C	C	E	D	C	D	D	D	F	D	A
Approach Vol, veh/h	426				845		997				2032	
Approach Delay, s/veh	43.4				27.6		43.3				52.3	
Approach LOS	D				C		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	35.0	37.0	10.0	35.1	28.4	43.6	17.3	27.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	31.0	48.7	11.0	71.4	11.0	* 69	22.0	60.4				
Max Q Clear Time (g_c+Q_c), s	33.0	28.6	6.6	8.7	9.0	32.4	13.2	21.3				
Green Ext Time (p_c), s	0.0	3.0	0.0	0.8	0.0	5.9	0.1	1.9				

### Intersection Summary

HCM 6th Ctrl Delay 44.5

HCM 6th LOS D

### Notes












\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	80	810	10	40	60	520	860	10	60	1190	180
Future Volume (veh/h)	160	80	810	10	40	60	520	860	10	60	1190	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	126	143	95	11	42	3	547	905	6	63	1253	176
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	226	238	403	15	58	62	676	1957	851	80	1759	247
Arrive On Green	0.13	0.13	0.13	0.04	0.04	0.04	0.19	0.55	0.55	0.04	0.39	0.38
Sat Flow, veh/h	1795	1885	3195	387	1479	1598	3483	3582	1558	1795	4552	639
Grp Volume(v), veh/h	126	143	95	53	0	3	547	905	6	63	945	484
Grp Sat Flow(s),veh/h/ln	1795	1885	1598	1866	0	1598	1742	1791	1558	1795	1716	1760
Q Serve(g_s), s	4.3	4.7	1.8	1.8	0.0	0.1	9.9	10.1	0.1	2.3	15.3	15.3
Cycle Q Clear(g_c), s	4.3	4.7	1.8	1.8	0.0	0.1	9.9	10.1	0.1	2.3	15.3	15.3
Prop In Lane	1.00		1.00	0.21		1.00	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	226	238	403	73	0	62	676	1957	851	80	1326	680
V/C Ratio(X)	0.56	0.60	0.24	0.73	0.00	0.05	0.81	0.46	0.01	0.78	0.71	0.71
Avail Cap(c_a), veh/h	602	632	1071	1108	0	949	1326	2946	1282	246	1986	1019
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.0	27.1	25.8	31.2	0.0	30.4	25.3	9.0	6.8	31.0	17.1	17.2
Incr Delay (d2), s/veh	0.8	0.9	0.1	5.1	0.0	0.1	0.9	0.1	0.0	6.1	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	2.0	0.6	0.9	0.0	0.0	3.7	2.9	0.0	1.1	5.5	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	28.0	25.9	36.3	0.0	30.5	26.2	9.1	6.8	37.2	17.3	17.7
LnGrp LOS	C	C	C	D	A	C	C	A	A	D	B	B
Approach Vol, veh/h	364			56			1458			1492		
Approach Delay, s/veh	27.4			36.0			15.5			18.3		
Approach LOS	C			D			B			B		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	6.9	39.9	12.3		16.7	30.1	6.6					
Change Period (Y+Rc), s	4.0	5.3	4.9		4.0	* 5.3	4.0					
Max Green Setting (Gmax), s	9.0	52.7	21.1		25.0	* 37	39.0					
Max Q Clear Time (g_c+14.3)	14.3	12.1	6.7		11.9	17.3	3.8					
Green Ext Time (p_c), s	0.0	4.1	0.7		0.9	7.2	0.1					

### Intersection Summary

HCM 6th Ctrl Delay	18.4
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↑↑↑			↰ ↑↑↑			↰ ↑		↰	↰	↰	
Traffic Volume (veh/h)	110	1260	270	110	870	40	210	60	90	50	30	80
Future Volume (veh/h)	110	1260	270	110	870	40	210	60	90	50	30	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	115	1312	215	115	906	17	219	62	22	52	31	14
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	149	1834	301	174	2217	42	334	342	288	70	153	69
Arrive On Green	0.08	0.41	0.41	0.10	0.43	0.42	0.10	0.18	0.18	0.04	0.12	0.10
Sat Flow, veh/h	1795	4446	728	1795	5199	97	3483	1885	1584	1795	1226	554
Grp Volume(v), veh/h	115	1013	514	115	598	325	219	62	22	52	0	45
Grp Sat Flow(s),veh/h/ln	1795	1716	1743	1795	1716	1865	1742	1885	1584	1795	0	1780
Q Serve(g_s), s	3.7	14.6	14.6	3.7	7.2	7.2	3.6	1.6	0.7	1.7	0.0	1.4
Cycle Q Clear(g_c), s	3.7	14.6	14.6	3.7	7.2	7.2	3.6	1.6	0.7	1.7	0.0	1.4
Prop In Lane	1.00		0.42	1.00		0.05	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	149	1415	719	174	1463	795	334	342	288	70	0	222
V/C Ratio(X)	0.77	0.72	0.72	0.66	0.41	0.41	0.66	0.18	0.08	0.75	0.00	0.20
Avail Cap(c_a), veh/h	515	3069	1559	515	3069	1669	823	1432	1203	273	0	1202
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.6	14.5	14.5	25.8	11.8	11.8	25.8	20.5	20.1	28.2	0.0	23.5
Incr Delay (d2), s/veh	3.1	0.3	0.5	1.6	0.1	0.1	0.8	0.1	0.0	5.8	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	4.4	4.6	1.5	2.1	2.3	1.4	0.6	0.2	0.8	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	14.8	15.0	27.4	11.9	11.9	26.7	20.6	20.2	34.0	0.0	23.6
LnGrp LOS	C	B	B	C	B	B	C	C	C	C	A	C
Approach Vol, veh/h	1642				1038		303				97	
Approach Delay, s/veh	15.9				13.6		25.0				29.2	
Approach LOS	B				B		C				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.3	14.8	9.8	28.4	9.7	11.4	8.9	29.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	4.0	43.7	17.0	* 53	14.0	38.7	17.0	* 53				
Max Q Clear Time (g_c+I1), s	13.8	3.6	5.7	16.6	5.6	3.4	5.7	9.2				
Green Ext Time (p_c), s	0.0	0.2	0.1	7.7	0.2	0.1	0.1	3.7				

### Intersection Summary

HCM 6th Ctrl Delay 16.4

HCM 6th LOS B





















### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Near Term PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	880	340	230	720	230	230	330	210	350	280	30
Future Volume (veh/h)	70	880	340	230	720	230	230	330	210	350	280	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	73	917	106	240	750	97	240	344	138	365	292	25
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	95	1389	160	283	1859	239	330	545	214	459	852	72
Arrive On Green	0.05	0.30	0.28	0.16	0.40	0.38	0.09	0.22	0.20	0.13	0.25	0.24
Sat Flow, veh/h	1810	4701	541	1810	4653	597	3510	2516	990	3510	3365	286
Grp Volume(v), veh/h	73	674	349	240	556	291	240	245	237	365	156	161
Grp Sat Flow(s),veh/h/ln	1810	1729	1784	1810	1729	1792	1755	1805	1701	1755	1805	1846
Q Serve(g_s), s	3.2	13.6	13.7	10.3	9.2	9.3	5.3	9.8	10.2	8.0	5.6	5.7
Cycle Q Clear(g_c), s	3.2	13.6	13.7	10.3	9.2	9.3	5.3	9.8	10.2	8.0	5.6	5.7
Prop In Lane	1.00		0.30	1.00		0.33	1.00		0.58	1.00		0.15
Lane Grp Cap(c), veh/h	95	1022	527	283	1382	716	330	391	368	459	457	467
V/C Ratio(X)	0.77	0.66	0.66	0.85	0.40	0.41	0.73	0.63	0.64	0.80	0.34	0.35
Avail Cap(c_a), veh/h	250	1823	941	568	2431	1260	617	929	875	705	974	996
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	24.6	24.8	32.7	17.1	17.3	35.1	28.3	28.8	33.6	24.3	24.4
Incr Delay (d2), s/veh	4.9	0.3	0.5	2.7	0.1	0.1	1.2	0.6	0.7	1.7	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	5.1	5.3	4.4	3.2	3.4	2.2	4.0	3.9	3.3	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.2	24.8	25.3	35.4	17.2	17.5	36.2	28.9	29.5	35.3	24.5	24.6
LnGrp LOS	D	C	C	D	B	B	D	C	C	D	C	C
Approach Vol, veh/h		1096			1087			722			682	
Approach Delay, s/veh		26.1			21.3			31.5			30.3	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.4	21.2	16.5	27.5	11.5	24.2	8.2	35.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7				
Max Q Clear Time (g_c+I1), s	10.0	12.2	12.3	15.7	7.3	7.7	5.2	11.3				
Green Ext Time (p_c), s	0.4	1.6	0.3	4.2	0.2	1.0	0.0	3.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			26.5									
HCM 6th LOS			C									







# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	960	160	140	1040	270	150	80	50	570	150	120
Future Volume (veh/h)	220	960	160	140	1040	270	150	80	50	570	150	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	229	1000	73	146	1083	81	156	83	5	594	156	33
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	271	1739	127	183	1576	482	121	437	26	696	931	407
Arrive On Green	0.15	0.36	0.34	0.10	0.31	0.31	0.07	0.13	0.11	0.20	0.26	0.26
Sat Flow, veh/h	1795	4894	357	1795	5147	1574	1795	3431	205	3483	3582	1566
Grp Volume(v), veh/h	229	701	372	146	1083	81	156	43	45	594	156	33
Grp Sat Flow(s),veh/h/ln	1795	1716	1820	1795	1716	1574	1795	1791	1845	1742	1791	1566
Q Serve(g_s), s	9.2	12.3	12.3	5.9	13.7	2.8	5.0	1.6	1.6	12.2	2.5	1.2
Cycle Q Clear(g_c), s	9.2	12.3	12.3	5.9	13.7	2.8	5.0	1.6	1.6	12.2	2.5	1.2
Prop In Lane	1.00		0.20	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	271	1219	647	183	1576	482	121	228	235	696	931	407
V/C Ratio(X)	0.85	0.57	0.58	0.80	0.69	0.17	1.29	0.19	0.19	0.85	0.17	0.08
Avail Cap(c_a), veh/h	339	2280	1209	266	3212	982	121	1079	1112	892	2834	1239
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.7	19.4	19.5	32.6	22.6	18.8	34.6	28.9	29.0	28.6	21.2	20.8
Incr Delay (d2), s/veh	12.4	0.2	0.3	6.2	0.2	0.1	178.5	0.1	0.1	5.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	4.3	4.6	2.7	4.9	0.9	8.0	0.6	0.7	5.1	1.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.1	19.5	19.8	38.8	22.8	18.9	213.1	29.1	29.2	34.0	21.3	20.8
LnGrp LOS	D	B	B	D	C	B	F	C	C	C	C	C
Approach Vol, veh/h	1302			1310			244			783		
Approach Delay, s/veh	23.7			24.4			146.8			30.9		
Approach LOS	C			C			F			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.4	11.6	30.4	9.0	23.3	15.2	26.7					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	11.0	48.0	5.0	57.4	14.0	45.0					
Max Q Clear Time (g_c+14.2), s	3.6	7.9	14.3	7.0	4.5	11.2	15.7					
Green Ext Time (p_c), s	0.6	0.2	0.0	4.5	0.0	0.6	0.1	5.2				

### Intersection Summary

HCM 6th Ctrl Delay	33.8
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1680	680	220	1810	0	0	0	0	750	0	780
Future Volume (veh/h)	0	1680	680	220	1810	0	0	0	0	750	0	780
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1768	328	232	1905	0				789	0	794
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1704	518	227	2445	0				1706	0	759
Arrive On Green	0.00	0.33	0.33	0.11	0.47	0.00				0.47	0.00	0.47
Sat Flow, veh/h	0	5358	1578	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	1768	328	232	1905	0				789	0	794
Grp Sat Flow(s),veh/h/ln	0	1729	1578	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	46.0	24.7	16.0	43.0	0.0				20.6	0.0	66.0
Cycle Q Clear(g_c), s	0.0	46.0	24.7	16.0	43.0	0.0				20.6	0.0	66.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1704	518	227	2445	0				1706	0	759
V/C Ratio(X)	0.00	1.04	0.63	1.02	0.78	0.00				0.46	0.00	1.05
Avail Cap(c_a), veh/h	0	1704	518	227	2445	0				1706	0	759
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	47.0	39.8	62.0	30.9	0.0				25.0	0.0	37.0
Incr Delay (d2), s/veh	0.0	32.2	1.9	64.9	1.5	0.0				0.1	0.0	45.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	24.2	9.6	6.0	17.4	0.0				8.6	0.0	34.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	79.2	41.8	126.9	32.4	0.0				25.1	0.0	82.3
LnGrp LOS	A	F	D	F	C	A				C	A	F
Approach Vol, veh/h		2096			2137						1583	
Approach Delay, s/veh		73.3			42.7						53.8	
Approach LOS		E			D						D	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	30.0	50.0		70.0		70.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	60.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I1), s	11.0	48.0		68.0		45.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		9.5						

## Intersection Summary

HCM 6th Ctrl Delay 56.7  
HCM 6th LOS E

## Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1900	530	170	1240	580	790	40	400	0	0	0
Future Volume (veh/h)	0	1900	530	170	1240	580	790	40	400	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	0	2000	360	179	1305	370	862	0	274			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	1	1	1	1	1	1	1	1			
Cap, veh/h	0	2403	734	212	3234	976	1023	0	455			
Arrive On Green	0.00	0.47	0.47	0.12	0.63	0.63	0.28	0.00	0.28			
Sat Flow, veh/h	0	5316	1572	1795	5147	1554	3591	0	1598			
Grp Volume(v), veh/h	0	2000	360	179	1305	370	862	0	274			
Grp Sat Flow(s),veh/h/ln	0	1716	1572	1795	1716	1554	1795	0	1598			
Q Serve(g_s), s	0.0	31.3	14.6	9.0	11.7	10.7	20.9	0.0	13.7			
Cycle Q Clear(g_c), s	0.0	31.3	14.6	9.0	11.7	10.7	20.9	0.0	13.7			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2403	734	212	3234	976	1023	0	455			
V/C Ratio(X)	0.00	0.83	0.49	0.84	0.40	0.38	0.84	0.00	0.60			
Avail Cap(c_a), veh/h	0	2675	817	214	3511	1060	1905	0	848			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	21.5	17.0	39.9	8.5	8.4	31.1	0.0	28.5			
Incr Delay (d2), s/veh	0.0	1.9	0.2	24.0	0.0	0.1	0.7	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	11.5	4.8	5.2	3.5	2.9	8.5	0.0	4.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.4	17.2	63.9	8.6	8.5	31.8	0.0	29.0			
LnGrp LOS	A	C	B	E	A	A	C	A	C			
Approach Vol, veh/h		2360			1854			1136				
Approach Delay, s/veh		22.5			13.9			31.1				
Approach LOS		C			B			C				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	4.9	47.1		30.3		62.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	4.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+I1), s	4.0	33.3		22.9		13.7						
Green Ext Time (p_c), s	0.0	8.5		2.2		7.8						

## Intersection Summary

HCM 6th Ctrl Delay	21.3
HCM 6th LOS	C

## Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	50	0	10	50	160	10	60	10	200	100	40
Future Volume (veh/h)	40	50	0	10	50	160	10	60	10	200	100	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	43	54	0	11	54	80	11	65	1	215	108	11
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	202	200	0	202	73	108	202	561	9	314	716	72
Arrive On Green	0.11	0.11	0.00	0.11	0.11	0.11	0.11	0.16	0.12	0.18	0.22	0.18
Sat Flow, veh/h	1795	1885	0	1795	686	1016	1795	3611	55	1795	3285	330
Grp Volume(v), veh/h	43	54	0	11	0	134	11	32	34	215	58	61
Grp Sat Flow(s),veh/h/ln	1795	1885	0	1795	0	1702	1795	1791	1875	1795	1791	1824
Q Serve(g_s), s	0.8	0.9	0.0	0.2	0.0	2.7	0.2	0.5	0.6	4.0	0.9	1.0
Cycle Q Clear(g_c), s	0.8	0.9	0.0	0.2	0.0	2.7	0.2	0.5	0.6	4.0	0.9	1.0
Prop In Lane	1.00		0.00	1.00		0.60	1.00		0.03	1.00		0.18
Lane Grp Cap(c), veh/h	202	200	0	202	0	181	202	278	291	314	390	397
V/C Ratio(X)	0.21	0.27	0.00	0.05	0.00	0.74	0.05	0.12	0.12	0.68	0.15	0.15
Avail Cap(c_a), veh/h	556	1911	0	556	0	1726	1062	2572	2693	1062	2572	2619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.3	14.6	0.0	14.1	0.0	15.4	14.1	12.9	12.9	13.7	11.2	11.3
Incr Delay (d2), s/veh	0.2	0.3	0.0	0.0	0.0	2.2	0.0	0.1	0.1	1.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.0	0.1	0.0	0.9	0.1	0.2	0.2	1.2	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.5	14.9	0.0	14.1	0.0	17.6	14.1	13.0	13.0	14.7	11.3	11.4
LnGrp LOS	B	B	A	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	97			145			77			334		
Approach Delay, s/veh	14.7			17.4			13.1			13.5		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	8.0	7.8	8.0	11.7	8.0	7.8					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+10), s	2.6	2.6	2.6	2.2	2.2	3.0	2.8	4.7				
Green Ext Time (p_c), s	0.2	0.2	0.0	0.1	0.0	0.4	0.0	0.4				

### Intersection Summary









HCM 6th Ctrl Delay	14.5
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	110	70	50	90	90	140	500	140	290	450	90
Future Volume (veh/h)	70	110	70	50	90	90	140	500	140	290	450	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	75	118	51	54	97	59	151	538	126	312	484	83
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	96	163	70	78	132	80	197	822	192	378	1181	202
Arrive On Green	0.05	0.13	0.13	0.04	0.12	0.12	0.11	0.28	0.26	0.21	0.38	0.36
Sat Flow, veh/h	1810	1258	544	1810	1106	673	1810	2905	678	1810	3084	526
Grp Volume(v), veh/h	75	0	169	54	0	156	151	333	331	312	282	285
Grp Sat Flow(s),veh/h/ln	1810	0	1802	1810	0	1779	1810	1805	1778	1810	1805	1805
Q Serve(g_s), s	2.0	0.0	4.3	1.4	0.0	4.0	3.9	7.7	7.9	7.9	5.5	5.6
Cycle Q Clear(g_c), s	2.0	0.0	4.3	1.4	0.0	4.0	3.9	7.7	7.9	7.9	5.5	5.6
Prop In Lane	1.00		0.30	1.00		0.38	1.00		0.38	1.00		0.29
Lane Grp Cap(c), veh/h	96	0	233	78	0	213	197	511	503	378	691	691
V/C Ratio(X)	0.78	0.00	0.72	0.70	0.00	0.73	0.77	0.65	0.66	0.82	0.41	0.41
Avail Cap(c_a), veh/h	418	0	1399	380	0	1344	721	1515	1492	645	1439	1439
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	0.0	19.9	22.5	0.0	20.3	20.6	15.0	15.3	18.0	10.8	10.9
Incr Delay (d2), s/veh	5.2	0.0	1.6	4.1	0.0	1.8	2.3	0.5	0.5	1.8	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.6	0.6	0.0	1.5	1.5	2.5	2.5	2.8	1.6	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.5	0.0	21.5	26.6	0.0	22.1	23.0	15.6	15.8	19.8	10.9	11.1
LnGrp LOS	C	A	C	C	A	C	C	B	B	B	B	B
Approach Vol, veh/h	244		210			815			879			
Approach Delay, s/veh	23.4		23.3			17.0			14.1			
Approach LOS	C		C			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.0	17.5	6.0	10.2	9.2	22.3	6.5	9.7				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	7.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0				
Max Q Clear Time (g_c+19, s)	9.9	9.9	3.4	6.3	5.9	7.6	4.0	6.0				
Green Ext Time (p_c), s	0.3	2.3	0.0	0.5	0.1	1.9	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay			17.2									
HCM 6th LOS			B									

# HCM 6th Signalized Intersection Summary 16: Deer Valley Road & Wellness Way

The Ranch  
Near Term PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	60	260	600	30	70	490
Future Volume (veh/h)	60	260	600	30	70	490
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	70	14	698	12	81	570
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	127	113	1417	618	124	2228
Arrive On Green	0.07	0.07	0.39	0.39	0.07	0.62
Sat Flow, veh/h	1810	1610	3705	1574	1810	3705
Grp Volume(v), veh/h	70	14	698	12	81	570
Grp Sat Flow(s), veh/h/ln	1810	1610	1805	1574	1810	1805
Q Serve(g_s), s	1.0	0.2	3.7	0.1	1.1	1.8
Cycle Q Clear(g_c), s	1.0	0.2	3.7	0.1	1.1	1.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	127	113	1417	618	124	2228
V/C Ratio(X)	0.55	0.12	0.49	0.02	0.65	0.26
Avail Cap(c_a), veh/h	2404	2139	5784	2522	2333	11003
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	11.2	5.9	4.8	11.6	2.2
Incr Delay (d2), s/veh	1.4	0.2	0.1	0.0	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.3	0.0	0.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.9	11.3	6.0	4.8	13.8	2.2
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	84		710			651
Approach Delay, s/veh	12.6		5.9			3.7
Approach LOS	B		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.8	14.0			19.8	5.8
Change Period (Y+Rc), s	4.0	5.3			5.3	4.0
Max Green Setting (Gmax), s	33.0	39.7			76.7	34.0
Max Q Clear Time (g_c+13, s)	13.6	5.7			3.8	3.0
Green Ext Time (p_c), s	0.1	3.0			2.3	0.1
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			5.3			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Near Term PM Peak Hour



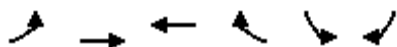
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↗	↕	↖	↗	↕	↖	↗	↕	↖
Traffic Volume (veh/h)	0	0	0	110	0	120	0	280	90	100	290	0
Future Volume (veh/h)	0	0	0	110	0	120	0	280	90	100	290	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	0	0	0	125	0	21	0	318	68	114	330	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	200	0	501	190	169	8	850	179	162	1983	0
Arrive On Green	0.00	0.00	0.00	0.11	0.00	0.11	0.00	0.29	0.23	0.09	0.55	0.00
Sat Flow, veh/h	0	1900	0	1810	1805	1610	1810	2966	626	1810	3705	0
Grp Volume(v), veh/h	0	0	0	125	0	21	0	192	194	114	330	0
Grp Sat Flow(s), veh/h/ln	0	1900	0	1810	1805	1610	1810	1805	1787	1810	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	1.5	0.0	0.3	0.0	2.0	2.1	1.4	1.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.5	0.0	0.3	0.0	2.0	2.1	1.4	1.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.35	1.00		0.00
Lane Grp Cap(c), veh/h	0	200	0	501	190	169	8	517	512	162	1983	0
V/C Ratio(X)	0.00	0.00	0.00	0.25	0.00	0.12	0.00	0.37	0.38	0.70	0.17	0.00
Avail Cap(c_a), veh/h	0	2872	0	3047	2729	2434	860	5613	5558	1641	12786	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	10.0	0.0	9.4	0.0	6.6	6.8	10.2	2.6	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.2	0.2	2.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.2	0.3	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	10.1	0.0	9.5	0.0	6.8	7.0	12.3	2.6	0.0
LnGrp LOS	A	A	A	B	A	A	A	A	A	B	A	A
Approach Vol, veh/h	0			146			386			444		
Approach Delay, s/veh	0.0			10.0			6.9			5.1		
Approach LOS				A			A			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	10.6		6.4	0.0	16.7		6.4				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	1.0	70.7		35.0	11.0	80.7		35.0				
Max Q Clear Time (g_c+13.4), s	1.0	4.1		0.0	0.0	3.0		3.5				
Green Ext Time (p_c), s	0.1	1.3		0.0	0.0	1.5		0.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				6.5								
HCM 6th LOS				A								



# HCM 6th Signalized Intersection Summary

## 18: Sand Creek Road & Hillcrest Avenue

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	100	120	110	200	10
Future Volume (veh/h)	10	100	120	110	200	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	109	130	8	217	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	741	886	848	52	414	368
Arrive On Green	0.25	0.25	0.25	0.22	0.23	0.23
Sat Flow, veh/h	1251	3647	3496	208	1781	1585
Grp Volume(v), veh/h	11	109	67	71	217	7
Grp Sat Flow(s), veh/h/ln	1251	1777	1777	1833	1781	1585
Q Serve(g_s), s	0.1	0.4	0.5	0.5	1.6	0.1
Cycle Q Clear(g_c), s	0.6	0.4	0.5	0.5	1.6	0.1
Prop In Lane	1.00			0.11	1.00	1.00
Lane Grp Cap(c), veh/h	741	886	443	457	414	368
V/C Ratio(X)	0.01	0.12	0.15	0.15	0.52	0.02
Avail Cap(c_a), veh/h	3672	9212	3742	3860	3694	3287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.7	4.5	4.5	4.5	5.2	4.6
Incr Delay (d2), s/veh	0.0	0.1	0.2	0.2	1.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.0	0.0	0.0	0.0	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	4.8	4.5	4.7	4.7	6.2	4.6
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		120	138		224	
Approach Delay, s/veh		4.6	4.7		6.2	
Approach LOS		A	A		A	
Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			7.8		7.6	7.8
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			39.5		31.5	32.0
Max Q Clear Time (g_c+I1), s			2.6		3.6	2.5
Green Ext Time (p_c), s			0.6		0.6	0.6
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			5.3			
HCM 6th LOS			A			

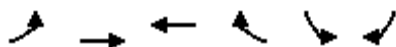
### Notes

User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

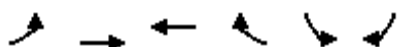
The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	280	220	120	140	10
Future Volume (veh/h)	10	280	220	120	140	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	304	239	53	152	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	39	804	413	90	1157	1029
Arrive On Green	0.02	0.23	0.14	0.13	0.65	0.65
Sat Flow, veh/h	1781	3647	2995	632	1781	1585
Grp Volume(v), veh/h	11	304	145	147	152	7
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1757	1781	1585
Q Serve(g_s), s	0.4	4.6	4.9	5.1	2.1	0.1
Cycle Q Clear(g_c), s	0.4	4.6	4.9	5.1	2.1	0.1
Prop In Lane	1.00			0.36	1.00	1.00
Lane Grp Cap(c), veh/h	39	804	253	250	1157	1029
V/C Ratio(X)	0.29	0.38	0.57	0.59	0.13	0.01
Avail Cap(c_a), veh/h	871	4415	1228	1214	1157	1029
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.9	21.0	25.7	25.9	4.3	4.0
Incr Delay (d2), s/veh	4.0	0.3	2.0	2.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.7	2.0	2.0	0.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	34.9	21.3	27.8	28.1	4.6	4.0
LnGrp LOS	C	C	C	C	A	A
Approach Vol, veh/h		315	292		159	
Approach Delay, s/veh		21.8	27.9		4.5	
Approach LOS		C	C		A	
Timer - Assigned Phs			4		6	7 8
Phs Duration (G+Y+Rc), s			18.5		45.7	5.4 13.1
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			79.3		41.2	30.9 43.9
Max Q Clear Time (g_c+I1), s			6.6		4.1	2.4 7.1
Green Ext Time (p_c), s			1.9		0.4	0.0 1.6
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			20.5			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	180	300	400	190	1420	80
Future Volume (veh/h)	180	300	400	190	1420	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	196	326	435	43	1543	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	237	554	554	469	1858	852
Arrive On Green	0.29	0.29	0.29	0.29	0.53	0.53
Sat Flow, veh/h	931	1900	1900	1610	3510	1610
Grp Volume(v), veh/h	196	326	435	43	1543	82
Grp Sat Flow(s),veh/h/ln	931	1900	1900	1610	1755	1610
Q Serve(g_s), s	3.6	6.5	9.4	0.9	16.5	1.1
Cycle Q Clear(g_c), s	13.0	6.5	9.4	0.9	16.5	1.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	237	554	554	469	1858	852
V/C Ratio(X)	0.83	0.59	0.79	0.09	0.83	0.10
Avail Cap(c_a), veh/h	237	554	554	469	6217	2852
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.6	13.5	14.5	11.5	8.8	5.2
Incr Delay (d2), s/veh	19.8	1.1	6.7	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	2.2	4.0	0.2	3.2	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	41.4	14.6	21.3	11.5	9.2	5.2
LnGrp LOS	D	B	C	B	A	A
Approach Vol, veh/h		522	478		1625	
Approach Delay, s/veh		24.7	20.4		9.0	
Approach LOS		C	C		A	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		17.0			17.0	27.6
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		11.7			11.7	77.7
Max Q Clear Time (g_c+I1), s		15.0			11.4	18.5
Green Ext Time (p_c), s		0.0			0.1	3.8
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			14.2			
HCM 6th LOS			B			













## Notes

User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
 Near Term PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 		 	 				
Traffic Volume (veh/h)	150	1580	0	0	310	990	280	10	260	0	0	0
Future Volume (veh/h)	150	1580	0	0	310	990	280	10	260	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	158	1663	0	0	326	609	303	0	232			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	297	2886	0	0	700	1186	856	0	381			
Arrive On Green	0.08	0.56	0.00	0.00	0.37	0.37	0.24	0.00	0.24			
Sat Flow, veh/h	3510	5358	0	0	1900	3220	3619	0	1610			
Grp Volume(v), veh/h	158	1663	0	0	326	609	303	0	232			
Grp Sat Flow(s),veh/h/ln	1755	1729	0	0	1900	1610	1810	0	1610			
Q Serve(g_s), s	1.7	8.1	0.0	0.0	5.1	5.7	2.7	0.0	5.0			
Cycle Q Clear(g_c), s	1.7	8.1	0.0	0.0	5.1	5.7	2.7	0.0	5.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	297	2886	0	0	700	1186	856	0	381			
V/C Ratio(X)	0.53	0.58	0.00	0.00	0.47	0.51	0.35	0.00	0.61			
Avail Cap(c_a), veh/h	1453	10064	0	0	2703	4582	4400	0	1958			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	17.0	5.6	0.0	0.0	9.3	9.5	12.3	0.0	13.2			
Incr Delay (d2), s/veh	0.6	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.5	1.0	0.0	0.0	1.3	1.2	0.8	0.0	4.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.5	5.7	0.0	0.0	9.5	9.6	12.4	0.0	13.7			
LnGrp LOS	B	A	A	A	A	A	B	A	B			
Approach Vol, veh/h	1821			935			535					
Approach Delay, s/veh	6.7			9.6			13.0					
Approach LOS	A			A			B					
Timer - Assigned Phs	2		4		5	6						
Phs Duration (G+Y+Rc), s	25.5		13.1		7.3	18.2						
Change Period (Y+Rc), s	5.3		5.3		4.0	5.3						
Max Green Setting (Gmax), s	73.7		45.7		16.0	53.7						
Max Q Clear Time (g_c+l1), s	10.1		7.0		3.7	7.7						
Green Ext Time (p_c), s	10.1		0.9		0.2	2.5						

## Intersection Summary




HCM 6th Ctrl Delay	8.5
HCM 6th LOS	A

## Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Near Term PM Peak Hour

Intersection						
Int Delay, s/veh	11.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	390	100	50	340	80
Future Vol, veh/h	40	390	100	50	340	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	44	429	110	55	374	88
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	974	138	0	0	165	0
Stage 1	138	-	-	-	-	-
Stage 2	836	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	282	916	-	-	1426	-
Stage 1	894	-	-	-	-	-
Stage 2	429	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	204	916	-	-	1426	-
Mov Cap-2 Maneuver	204	-	-	-	-	-
Stage 1	894	-	-	-	-	-
Stage 2	311	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	20.7	0		6.8		
HCM LOS	C					
Minor Lane/Major Mvmt		NBT	NBRWBLn1	SBL	SBT	
Capacity (veh/h)		-	-	691	1426	-
HCM Lane V/C Ratio		-	-	0.684	0.262	-
HCM Control Delay (s)		-	-	20.7	8.4	0
HCM Lane LOS		-	-	C	A	A
HCM 95th %tile Q(veh)		-	-	5.4	1.1	-

# HCM 6th Signalized Intersection Summary

## 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Near Term PM Peak Hour



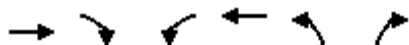
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↰↰	↰	↰	↰↰	
Traffic Volume (veh/h)	80	1300	810	30	630	610	
Future Volume (veh/h)	80	1300	810	30	630	610	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	85	1383	862	0	670	615	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	155	1528	1244		892	1522	
Arrive On Green	0.04	0.43	0.35	0.00	0.50	0.50	
Sat Flow, veh/h	3456	3647	3647	1585	1781	2790	
Grp Volume(v), veh/h	85	1383	862	0	670	615	
Grp Sat Flow(s),veh/h/ln	1728	1777	1777	1585	1781	1395	
Q Serve(g_s), s	2.8	41.8	23.9	0.0	34.6	14.8	
Cycle Q Clear(g_c), s	2.8	41.8	23.9	0.0	34.6	14.8	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	155	1528	1244		892	1522	
V/C Ratio(X)	0.55	0.91	0.69		0.75	0.40	
Avail Cap(c_a), veh/h	361	1740	1245		892	1522	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	53.8	30.6	32.1	0.0	23.0	15.2	
Incr Delay (d2), s/veh	1.1	6.1	1.4	0.0	3.2	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.2	17.9	10.0	0.0	14.8	14.3	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	54.9	36.7	33.5	0.0	26.2	15.3	
LnGrp LOS	D	D	C		C	B	
Approach Vol, veh/h							
		1468	862	A	1285		
Approach Delay, s/veh							
		37.8	33.5		21.0		
Approach LOS							
		D	C		C		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				53.4	61.6	9.2	44.3
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				55.8	50.2	11.5	39.8
Max Q Clear Time (g_c+I1), s				43.8	36.6	4.8	25.9
Green Ext Time (p_c), s				5.2	2.5	0.1	3.2
Intersection Summary							
HCM 6th Ctrl Delay			30.8				
HCM 6th LOS			C				

### Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Near Term PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑	↘↘	↗
Traffic Volume (veh/h)	1380	580	0	1230	150	70
Future Volume (veh/h)	1380	580	0	1230	150	70
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1500	401	0	1337	163	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1902	848	0	1902	1366	627
Arrive On Green	0.54	0.54	0.00	0.54	0.40	0.40
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1500	401	0	1337	163	22
Grp Sat Flow(s),veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	39.0	18.1	0.0	32.2	3.4	1.0
Cycle Q Clear(g_c), s	39.0	18.1	0.0	32.2	3.4	1.0
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1902	848	0	1902	1366	627
V/C Ratio(X)	0.79	0.47	0.00	0.70	0.12	0.04
Avail Cap(c_a), veh/h	2565	1144	0	2565	1366	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	16.6	0.0	19.9	22.1	21.3
Incr Delay (d2), s/veh	1.2	0.4	0.0	0.6	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	6.5	0.0	12.2	1.4	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.7	17.0	0.0	20.5	22.2	21.4
LnGrp LOS	C	B	A	C	C	C
Approach Vol, veh/h	1901			1337	185	
Approach Delay, s/veh	21.5			20.5	22.1	
Approach LOS	C			C	C	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	49.5		65.5		65.5	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	23.5		82.5		82.5	
Max Q Clear Time (g_c+I1), s	5.4		41.0		34.2	
Green Ext Time (p_c), s	0.5		20.0		12.6	
Intersection Summary						
HCM 6th Ctrl Delay			21.1			
HCM 6th LOS			C			














# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Near Term PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	30	180	0	20	0	10	160	0	10	260	150
Future Volume (veh/h)	180	30	180	0	20	0	10	160	0	10	260	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	191	32	191	0	21	0	11	170	0	11	277	160
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	265	768	651	5	272	0	52	754	336	52	754	336
Arrive On Green	0.15	0.41	0.41	0.00	0.15	0.00	0.03	0.21	0.00	0.03	0.21	0.21
Sat Flow, veh/h	1781	1870	1585	1781	1870	0	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	191	32	191	0	21	0	11	170	0	11	277	160
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	0	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.5	0.4	2.8	0.0	0.3	0.0	0.2	1.4	0.0	0.2	2.3	3.0
Cycle Q Clear(g_c), s	3.5	0.4	2.8	0.0	0.3	0.0	0.2	1.4	0.0	0.2	2.3	3.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	265	768	651	5	272	0	52	754	336	52	754	336
V/C Ratio(X)	0.72	0.04	0.29	0.00	0.08	0.00	0.21	0.23	0.00	0.21	0.37	0.48
Avail Cap(c_a), veh/h	284	1004	851	284	1004	0	284	2011	897	284	2011	897
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.0	6.1	6.8	0.0	12.7	0.0	16.3	11.2	0.0	16.3	11.6	11.9
Incr Delay (d2), s/veh	8.0	0.0	0.2	0.0	0.1	0.0	2.0	0.2	0.0	2.0	0.3	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.1	0.6	0.0	0.1	0.0	0.1	0.4	0.0	0.1	0.6	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	6.1	7.1	0.0	12.8	0.0	18.4	11.4	0.0	18.4	11.9	12.9
LnGrp LOS	C	A	A	A	B	A	B	B	A	B	B	B
Approach Vol, veh/h	414			21			181			448		
Approach Delay, s/veh	13.8			12.8			11.8			12.4		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.0	11.3	0.0	18.2	5.0	11.3	9.1	9.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+I2, s)	12.2	3.4	0.0	4.8	2.2	5.0	5.5	2.3				
Green Ext Time (p_c), s	0.0	0.7	0.0	0.6	0.0	1.8	0.0	0.0				


### Intersection Summary

HCM 6th Ctrl Delay	12.9
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Near Term Plus Project AM Peak Hour









												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔		↗	↔↔	↕↕			↕↕↕	↗
Traffic Volume (veh/h)	0	0	0	240	0	300	1130	835	0	0	701	440
Future Volume (veh/h)	0	0	0	240	0	300	1130	835	0	0	701	440
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				282	0	221	1329	982	0	0	825	166
Peak Hour Factor				0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %				1	0	1	2	2	0	0	2	2
Cap, veh/h				655	0	300	1470	2491	0	0	1415	346
Arrive On Green				0.19	0.00	0.19	0.43	0.70	0.00	0.00	0.22	0.22
Sat Flow, veh/h				3483	0	1598	3456	3647	0	0	6696	1571
Grp Volume(v), veh/h				282	0	221	1329	982	0	0	825	166
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1728	1777	0	0	1609	1571
Q Serve(g_s), s				5.2	0.0	9.4	25.9	8.2	0.0	0.0	8.3	6.6
Cycle Q Clear(g_c), s				5.2	0.0	9.4	25.9	8.2	0.0	0.0	8.3	6.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				655	0	300	1470	2491	0	0	1415	346
V/C Ratio(X)				0.43	0.00	0.74	0.90	0.39	0.00	0.00	0.58	0.48
Avail Cap(c_a), veh/h				2079	0	954	2159	4391	0	0	3573	872
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				25.8	0.0	27.6	19.3	4.4	0.0	0.0	25.1	24.5
Incr Delay (d2), s/veh				0.2	0.0	1.3	3.1	0.0	0.0	0.0	0.1	0.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.0	0.0	3.4	9.2	1.6	0.0	0.0	2.9	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				26.0	0.0	28.9	22.5	4.5	0.0	0.0	25.3	24.9
LnGrp LOS				C	A	C	C	A	A	A	C	C
Approach Vol, veh/h					503			2311			991	
Approach Delay, s/veh					27.3			14.8			25.2	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		54.5			34.6	19.8		17.5				
Change Period (Y+Rc), s		5.3			4.0	5.3		5.3				
Max Green Setting (Gmax), s		87.7			45.0	38.7		41.7				
Max Q Clear Time (g_c+I1), s		10.2			27.9	10.3		11.4				
Green Ext Time (p_c), s		4.6			2.8	3.9		0.8				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				19.2								
HCM 6th LOS				B								

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  				
Traffic Volume (veh/h)	370	0	621	0	0	0	0	1605	200	290	671	0
Future Volume (veh/h)	370	0	621	0	0	0	0	1605	200	290	671	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1885	1885	1870	1870	0
Adj Flow Rate, veh/h	430	0	722				0	1866	214	337	780	0
Peak Hour Factor	0.86	0.86	0.86				0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3				0	1	1	2	2	0
Cap, veh/h	1071	0	953				0	2507	287	430	2062	0
Arrive On Green	0.30	0.00	0.30				0.00	0.42	0.41	0.12	0.58	0.00
Sat Flow, veh/h	3534	0	3145				0	6208	681	3456	3647	0
Grp Volume(v), veh/h	430	0	722				0	1527	553	337	780	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1621	1761	1728	1777	0
Q Serve(g_s), s	7.7	0.0	16.6				0.0	21.1	21.2	7.5	9.4	0.0
Cycle Q Clear(g_c), s	7.7	0.0	16.6				0.0	21.1	21.2	7.5	9.4	0.0
Prop In Lane	1.00		1.00				0.00		0.39	1.00		0.00
Lane Grp Cap(c), veh/h	1071	0	953				0	2051	743	430	2062	0
V/C Ratio(X)	0.40	0.00	0.76				0.00	0.74	0.74	0.78	0.38	0.00
Avail Cap(c_a), veh/h	3060	0	2722				0	2563	928	737	2809	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.0	0.0	25.1				0.0	19.4	19.7	33.8	9.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.3				0.0	0.7	1.8	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	5.7				0.0	7.0	7.9	3.0	2.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.3	0.0	26.4				0.0	20.1	21.4	35.0	9.0	0.0
LnGrp LOS	C	A	C				A	C	C	D	A	A
Approach Vol, veh/h	1152						2080			1117		
Approach Delay, s/veh	24.8						20.4			16.9		
Approach LOS	C						C			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), \$3.9	37.6		28.2		51.5							
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	7.0	40.7	68.5		* 63							
Max Q Clear Time (g_c+1.9, s)	19.5	23.2	18.6		11.4							
Green Ext Time (p_c), s	0.4	9.1	5.1		3.4							

### Intersection Summary

HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.












\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	90	465	80	110	240	490	984	30	620	30
Future Volume (veh/h)	20	0	90	465	80	110	240	490	984	30	620	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1841	1841	1841	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	24	0	0	547	94	70	282	576	416	35	729	30
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	8	8	4	4	4	2	2	2	5	5	5
Cap, veh/h	38	61	0	769	164	122	342	1488	1150	136	1035	43
Arrive On Green	0.02	0.00	0.00	0.16	0.17	0.16	0.19	0.42	0.42	0.08	0.30	0.29
Sat Flow, veh/h	1697	1781	0	4944	980	730	1781	3554	2745	1739	3395	140
Grp Volume(v), veh/h	24	0	0	547	0	164	282	576	416	35	372	387
Grp Sat Flow(s),veh/h/ln	1697	1781	0	1648	0	1709	1781	1777	1373	1739	1735	1800
Q Serve(g_s), s	0.7	0.0	0.0	5.4	0.0	4.5	7.8	5.7	5.3	1.0	9.7	9.7
Cycle Q Clear(g_c), s	0.7	0.0	0.0	5.4	0.0	4.5	7.8	5.7	5.3	1.0	9.7	9.7
Prop In Lane	1.00		0.00	1.00		0.43	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	38	61	0	769	0	286	342	1488	1150	136	529	549
V/C Ratio(X)	0.63	0.00	0.00	0.71	0.00	0.57	0.82	0.39	0.36	0.26	0.70	0.70
Avail Cap(c_a), veh/h	166	1036	0	1161	0	1228	593	3359	2595	136	1198	1244
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	0.0	0.0	20.5	0.0	19.7	19.8	10.3	10.2	22.1	15.7	15.8
Incr Delay (d2), s/veh	6.1	0.0	0.0	0.5	0.0	0.7	1.9	0.1	0.1	0.4	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.8	0.0	1.6	2.8	1.6	1.2	0.4	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	0.0	0.0	20.9	0.0	20.4	21.7	10.4	10.2	22.5	16.4	16.4
LnGrp LOS	C	A	A	C	A	C	C	B	B	C	B	B
Approach Vol, veh/h	24			711			1274			794		
Approach Delay, s/veh	30.8			20.8			12.8			16.6		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	25.4	11.9	5.7	13.8	19.6	5.2	12.5				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	47.4	12.0	29.1	17.0	34.4	5.0	36.1				
Max Q Clear Time (g_c+13), s	4.0	7.7	7.4	0.0	9.8	11.7	2.7	6.5				
Green Ext Time (p_c), s	0.0	3.4	0.6	0.0	0.2	2.6	0.0	0.5				

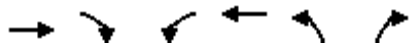
### Intersection Summary

HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	250	754	60	300	345	180
Future Volume (veh/h)	250	754	60	300	345	180
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1366	1366	1856	1856
Adj Flow Rate, veh/h	269	264	65	323	371	39
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	36	36	3	3
Cap, veh/h	1087	479	222	730	636	292
Arrive On Green	0.31	0.31	0.09	0.53	0.19	0.19
Sat Flow, veh/h	3647	1567	2525	1366	3428	1572
Grp Volume(v), veh/h	269	264	65	323	371	39
Grp Sat Flow(s), veh/h/ln	1777	1567	1262	1366	1714	1572
Q Serve(g_s), s	1.6	4.0	0.7	4.1	2.8	0.6
Cycle Q Clear(g_c), s	1.6	4.0	0.7	4.1	2.8	0.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1087	479	222	730	636	292
V/C Ratio(X)	0.25	0.55	0.29	0.44	0.58	0.13
Avail Cap(c_a), veh/h	6724	2965	495	3045	2210	1014
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.4	8.3	12.2	4.1	10.6	9.7
Incr Delay (d2), s/veh	0.0	0.4	0.7	0.2	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.7	0.1	0.1	0.8	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.5	8.6	12.9	4.2	10.9	9.8
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	533			388	410	
Approach Delay, s/veh	8.1			5.7	10.8	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		9.3	6.5	12.7		19.2
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		18.4	5.1	53.4		63.0
Max Q Clear Time (g_c+I1), s		4.8	2.7	6.0		6.1
Green Ext Time (p_c), s		0.7	0.0	1.4		1.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			8.2			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	👉👉		👉👉👉					👈👈👈		👉👉	👈👈👈	
Traffic Volume (veh/h)	180	20	875	0	0	0	10	1494	394	170	705	0
Future Volume (veh/h)	180	20	875	0	0	0	10	1494	394	170	705	0
Initial Q (Qb), veh	0	0	60				0	60	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				1870	1870	1870	1826	1826	0
Adj Flow Rate, veh/h	205	23	403				11	1698	407	193	801	0
Peak Hour Factor	0.88	0.88	0.88				0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2				2	2	2	5	5	0
Cap, veh/h	586	0	608				59	2593	512	278	3610	0
Arrive On Green	0.17	0.17	0.17				0.54	0.54	0.53	0.09	0.70	0.00
Sat Flow, veh/h	3456	0	3614				9	4346	1037	3374	5149	0
Grp Volume(v), veh/h	205	0	403				728	801	586	193	801	0
Grp Sat Flow(s), veh/h/ln	1728	0	1205				1855	1021	1494	1687	1662	0
Q Serve(g_s), s	3.4	0.0	6.7				0.0	19.0	19.2	3.6	3.6	0.0
Cycle Q Clear(g_c), s	3.4	0.0	6.7				18.7	19.0	19.2	3.6	3.6	0.0
Prop In Lane	1.00		1.00				0.02		0.69	1.00		0.00
Lane Grp Cap(c), veh/h	586	0	608				1081	1153	840	278	3610	0
V/C Ratio(X)	0.35	0.00	0.66				0.67	0.70	0.70	0.69	0.22	0.00
Avail Cap(c_a), veh/h	971	0	1015				2008	2167	1585	632	3655	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.4	0.0	44.5				12.2	13.1	12.4	35.9	3.5	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.5				0.3	0.3	0.4	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	203.6				4.2	16.0	7.6	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	16.6				9.3	8.0	8.6	1.8	0.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.5	0.0	248.5				16.7	29.4	20.4	37.1	3.5	0.0
LnGrp LOS	C	A	F				B	C	C	D	A	A
Approach Vol, veh/h		608						2116			994	
Approach Delay, s/veh		174.7						22.5			10.0	
Approach LOS		F						C			B	
Timer - Assigned Phs	1	2		4			6					
Phs Duration (G+Y+Rc), s	0.4	38.7		14.9			49.2					
Change Period (Y+Rc), s	4.9	* 4.9		5.3			4.9					
Max Green Setting (Gmax), s	2.0	* 67		16.7			46.1					
Max Q Clear Time (g_c+I), s	15.6	21.2		8.7			5.6					
Green Ext Time (p_c), s	0.2	12.7		1.0			3.6					

### Intersection Summary

HCM 6th Ctrl Delay	44.1
HCM 6th LOS	D

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Contra Loma Plaza/Davison Drive

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	↰
Traffic Volume (veh/h)	30	20	20	200	30	240	20	1435	120	170	922	20
Future Volume (veh/h)	30	20	20	200	30	240	20	1435	120	170	922	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	23	0	227	34	13	23	1631	133	193	1048	23
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	1	1	1	2	2	2	2	2	2
Cap, veh/h	67	45	98	277	291	246	33	1839	149	262	2166	48
Arrive On Green	0.06	0.06	0.00	0.15	0.15	0.15	0.02	0.55	0.55	0.08	0.61	0.60
Sat Flow, veh/h	1075	727	1572	1795	1885	1595	1781	3329	269	3456	3553	78
Grp Volume(v), veh/h	57	0	0	227	34	13	23	863	901	193	524	547
Grp Sat Flow(s), veh/h/ln	1802	0	1572	1795	1885	1595	1781	1777	1821	1728	1777	1854
Q Serve(g_s), s	3.2	0.0	0.0	12.6	1.6	0.7	1.3	43.6	45.2	5.6	16.8	16.9
Cycle Q Clear(g_c), s	3.2	0.0	0.0	12.6	1.6	0.7	1.3	43.6	45.2	5.6	16.8	16.9
Prop In Lane	0.60		1.00	1.00		1.00	1.00		0.15	1.00		0.04
Lane Grp Cap(c), veh/h	112	0	98	277	291	246	33	982	1006	262	1083	1130
V/C Ratio(X)	0.51	0.00	0.00	0.82	0.12	0.05	0.69	0.88	0.90	0.74	0.48	0.48
Avail Cap(c_a), veh/h	611	0	534	661	694	587	276	1292	1324	536	1292	1348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.8	0.0	0.0	42.2	37.6	37.2	50.3	20.1	20.5	46.7	11.2	11.2
Incr Delay (d2), s/veh	1.3	0.0	0.0	2.3	0.1	0.0	9.0	4.8	5.6	1.5	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.0	5.5	0.7	0.3	0.7	16.8	18.1	2.5	6.2	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.2	0.0	0.0	44.5	37.6	37.2	59.4	24.9	26.1	48.2	11.3	11.3
LnGrp LOS	D	A	A	D	D	D	E	C	C	D	B	B
Approach Vol, veh/h	57			274			1787			1264		
Approach Delay, s/veh	48.2			43.3			25.9			16.9		
Approach LOS	D			D			C			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.8	61.0		10.4	5.9	66.9		19.9				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+11), s	6	47.2		5.2	3.3	18.9		14.6				
Green Ext Time (p_c), s	0.2	9.2		0.1	0.0	5.3		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				24.4								
HCM 6th LOS				C								













# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	130	70	70	140	700	70	708	20	510	879	130
Future Volume (veh/h)	150	130	70	70	140	700	70	708	20	510	879	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	169	146	25	79	157	787	79	796	21	573	988	72
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	2	2	2
Cap, veh/h	202	981	164	101	953	1268	193	969	26	659	1217	701
Arrive On Green	0.11	0.32	0.32	0.06	0.27	0.26	0.11	0.27	0.26	0.19	0.34	0.33
Sat Flow, veh/h	1781	3037	509	1795	3582	2812	1795	3564	94	3456	3554	1582
Grp Volume(v), veh/h	169	84	87	79	157	787	79	400	417	573	988	72
Grp Sat Flow(s),veh/h/ln	1781	1777	1768	1795	1791	1406	1795	1791	1867	1728	1777	1582
Q Serve(g_s), s	9.4	3.4	3.6	4.4	3.4	21.6	4.2	21.2	21.2	16.3	25.7	1.5
Cycle Q Clear(g_c), s	9.4	3.4	3.6	4.4	3.4	21.6	4.2	21.2	21.2	16.3	25.7	1.5
Prop In Lane	1.00		0.29	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	202	574	571	101	953	1268	193	487	507	659	1217	701
V/C Ratio(X)	0.84	0.15	0.15	0.78	0.16	0.62	0.41	0.82	0.82	0.87	0.81	0.10
Avail Cap(c_a), veh/h	404	1298	1292	177	2156	2213	195	848	884	1091	2420	1237
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.0	24.4	24.5	47.2	28.5	21.2	42.2	34.6	34.6	39.8	30.3	6.3
Incr Delay (d2), s/veh	3.5	0.0	0.0	4.8	0.0	0.2	0.5	1.3	1.3	2.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	1.4	1.4	2.0	1.4	6.5	1.8	8.9	9.3	7.0	10.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.5	24.4	24.5	51.9	28.6	21.4	42.7	35.9	35.9	42.0	30.9	6.3
LnGrp LOS	D	C	C	D	C	C	D	D	D	D	C	A
Approach Vol, veh/h	340			1023			896			1633		
Approach Delay, s/veh	35.9			24.8			36.5			33.7		
Approach LOS	D			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.3	31.5	9.7	36.7	16.2	38.7	15.5	31.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	32.0	46.7	10.0	73.4	11.0	* 68	23.0	60.4				
Max Q Clear Time (g_c+11.0), s	19.3	23.2	6.4	5.6	6.2	27.7	11.4	23.6				
Green Ext Time (p_c), s	1.0	2.8	0.0	0.5	0.0	5.7	0.2	2.5				

### Intersection Summary

HCM 6th Ctrl Delay	32.2
HCM 6th LOS	C

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	60	621	10	100	60	825	1425	10	70	862	160
Future Volume (veh/h)	170	60	621	10	100	60	825	1425	10	70	862	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	116	139	82	10	101	7	833	1439	5	71	871	144
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	2	2	2
Cap, veh/h	210	221	374	15	153	141	959	1872	816	91	1272	209
Arrive On Green	0.12	0.12	0.12	0.09	0.09	0.09	0.28	0.52	0.52	0.05	0.29	0.28
Sat Flow, veh/h	1795	1885	3195	168	1694	1552	3483	3582	1562	1781	4403	724
Grp Volume(v), veh/h	116	139	82	111	0	7	833	1439	5	71	672	343
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1862	0	1552	1742	1791	1562	1781	1702	1723
Q Serve(g_s), s	4.5	5.1	1.7	4.2	0.0	0.3	16.7	23.5	0.1	2.9	12.8	13.0
Cycle Q Clear(g_c), s	4.5	5.1	1.7	4.2	0.0	0.3	16.7	23.5	0.1	2.9	12.8	13.0
Prop In Lane	1.00		1.00	0.09		1.00	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	210	221	374	169	0	141	959	1872	816	91	983	498
V/C Ratio(X)	0.55	0.63	0.22	0.66	0.00	0.05	0.87	0.77	0.01	0.78	0.68	0.69
Avail Cap(c_a), veh/h	441	463	785	991	0	826	1569	2739	1194	268	1580	800
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.5	30.8	29.3	32.2	0.0	30.4	25.3	14.0	8.4	34.3	23.1	23.2
Incr Delay (d2), s/veh	0.8	1.1	0.1	1.6	0.0	0.1	1.6	0.4	0.0	5.2	0.3	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	2.2	0.6	1.8	0.0	0.1	6.3	7.5	0.0	1.3	4.9	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.4	31.9	29.4	33.8	0.0	30.5	26.9	14.4	8.4	39.6	23.4	23.9
LnGrp LOS	C	C	C	C	A	C	C	B	A	D	C	C
Approach Vol, veh/h	337			118			2277			1086		
Approach Delay, s/veh	31.1			33.6			18.9			24.6		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	42.3		12.6	24.2	25.9		10.6				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	1.0	54.7		17.1	33.0	* 33		39.0				
Max Q Clear Time (g_c+14), s	14.5	25.5		7.1	18.7	15.0		6.2				
Green Ext Time (p_c), s	0.0	7.7		0.5	1.5	4.6		0.3				

### Intersection Summary

HCM 6th Ctrl Delay	22.1
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↑↑ ↱			↰ ↑↑ ↱			↰ ↱	↑	↰ ↱	↰ ↱	↰ ↱	
Traffic Volume (veh/h)	50	843	260	192	1232	70	459	150	181	70	181	120
Future Volume (veh/h)	50	843	260	192	1232	70	459	150	181	70	181	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	57	969	188	221	1416	27	528	172	48	80	208	117
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	74	1189	230	253	1951	37	588	711	588	103	298	167
Arrive On Green	0.04	0.28	0.27	0.14	0.38	0.37	0.17	0.38	0.38	0.06	0.26	0.25
Sat Flow, veh/h	1795	4315	835	1795	5196	99	3483	1885	1560	1810	1124	632
Grp Volume(v), veh/h	57	770	387	221	935	508	528	172	48	80	0	325
Grp Sat Flow(s),veh/h/ln	1795	1716	1718	1795	1716	1865	1742	1885	1560	1810	0	1757
Q Serve(g_s), s	3.4	22.4	22.5	12.9	25.0	25.0	15.9	6.7	2.1	4.7	0.0	17.9
Cycle Q Clear(g_c), s	3.4	22.4	22.5	12.9	25.0	25.0	15.9	6.7	2.1	4.7	0.0	17.9
Prop In Lane	1.00		0.49	1.00		0.05	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	74	945	473	253	1288	700	588	711	588	103	0	465
V/C Ratio(X)	0.77	0.81	0.82	0.87	0.73	0.73	0.90	0.24	0.08	0.78	0.00	0.70
Avail Cap(c_a), veh/h	151	1330	666	404	1812	985	620	840	696	186	0	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.7	36.1	36.2	44.9	28.6	28.6	43.5	22.8	21.4	49.7	0.0	35.6
Incr Delay (d2), s/veh	6.3	1.8	3.7	7.3	0.4	0.7	14.8	0.1	0.0	4.7	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	9.1	9.5	6.0	9.7	10.6	7.8	2.8	0.7	2.2	0.0	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.0	38.0	40.0	52.2	29.0	29.4	58.3	22.9	21.4	54.4	0.0	36.3
LnGrp LOS	E	D	D	D	C	C	E	C	C	D	A	D
Approach Vol, veh/h	1214		1664				748			405		
Approach Delay, s/veh	39.5		32.2				47.8			39.9		
Approach LOS	D		C				D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	44.2	19.0	33.4	22.0	32.3	8.4	44.1					
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	46.3	24.0	* 41	19.0	38.3	9.0	* 56					
Max Q Clear Time (g_c+1/6), s	8.7	14.9	24.5	17.9	19.9	5.4	27.0					
Green Ext Time (p_c), s	0.0	0.6	0.2	4.5	0.2	1.1	0.0	6.6				

### Intersection Summary

HCM 6th Ctrl Delay 38.1

HCM 6th LOS D

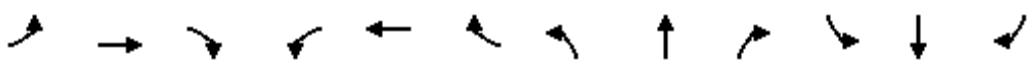
### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Near Term Plus Project AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰↰		↰	↰↰↰		↰↰	↰↰		↰↰	↰↰	
Traffic Volume (veh/h)	30	681	327	266	930	290	392	337	167	340	565	20
Future Volume (veh/h)	30	681	327	266	930	290	392	337	167	340	565	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	35	792	110	309	1081	118	456	392	142	395	657	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	44	1206	166	338	2010	219	516	698	249	460	905	29
Arrive On Green	0.02	0.27	0.25	0.19	0.43	0.42	0.15	0.27	0.26	0.13	0.26	0.24
Sat Flow, veh/h	1795	4536	624	1781	4666	509	3483	2568	917	3483	3538	113
Grp Volume(v), veh/h	35	597	305	309	788	411	456	272	262	395	332	346
Grp Sat Flow(s),veh/h/ln	1795	1716	1729	1781	1702	1770	1742	1791	1693	1742	1791	1860
Q Serve(g_s), s	2.2	17.6	17.9	19.4	19.5	19.6	14.6	14.8	15.3	12.6	19.3	19.3
Cycle Q Clear(g_c), s	2.2	17.6	17.9	19.4	19.5	19.6	14.6	14.8	15.3	12.6	19.3	19.3
Prop In Lane	1.00		0.36	1.00		0.29	1.00		0.54	1.00		0.06
Lane Grp Cap(c), veh/h	44	912	460	338	1466	763	516	487	461	460	458	476
V/C Ratio(X)	0.79	0.65	0.66	0.91	0.54	0.54	0.88	0.56	0.57	0.86	0.73	0.73
Avail Cap(c_a), veh/h	95	1145	577	422	1764	917	581	613	580	612	629	653
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.2	37.2	37.5	45.2	24.0	24.2	47.5	35.6	36.0	48.4	38.7	38.8
Incr Delay (d2), s/veh	10.8	0.4	1.0	19.2	0.1	0.2	12.8	0.4	0.4	7.4	1.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	7.2	7.5	10.1	7.4	7.8	7.1	6.3	6.2	5.8	8.3	8.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.0	37.6	38.5	64.5	24.1	24.4	60.4	36.0	36.5	55.8	40.1	40.1
LnGrp LOS	E	D	D	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h		937			1508			990			1073	
Approach Delay, s/veh		39.0			32.5			47.3			45.9	
Approach LOS		D			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.0	35.0	25.6	34.3	20.9	33.1	6.8	53.1				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+I1), s	14.6	17.3	21.4	19.9	16.6	21.3	4.2	21.6				
Green Ext Time (p_c), s	0.4	1.8	0.2	3.3	0.3	2.1	0.0	5.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			40.3									
HCM 6th LOS			D									

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱ ↲			↰ ↱ ↲			↰ ↱			↰ ↱ ↲		
Traffic Volume (veh/h)	180	605	70	64	1058	170	220	90	55	350	102	234
Future Volume (veh/h)	180	605	70	64	1058	170	220	90	55	350	102	234
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	202	680	25	72	1189	55	247	101	6	393	115	151
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	178	2081	76	91	1856	574	179	530	31	405	612	267
Arrive On Green	0.10	0.41	0.39	0.05	0.36	0.36	0.10	0.15	0.13	0.12	0.17	0.17
Sat Flow, veh/h	1781	5053	185	1781	5106	1579	1795	3437	203	3483	3582	1564
Grp Volume(v), veh/h	202	457	248	72	1189	55	247	52	55	393	115	151
Grp Sat Flow(s),veh/h/ln	1781	1702	1834	1781	1702	1579	1795	1791	1848	1742	1791	1564
Q Serve(g_s), s	6.0	5.5	5.5	2.4	11.6	1.4	6.0	1.5	1.6	6.8	1.7	5.3
Cycle Q Clear(g_c), s	6.0	5.5	5.5	2.4	11.6	1.4	6.0	1.5	1.6	6.8	1.7	5.3
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	178	1402	755	91	1856	574	179	276	285	405	612	267
V/C Ratio(X)	1.14	0.33	0.33	0.79	0.64	0.10	1.38	0.19	0.19	0.97	0.19	0.56
Avail Cap(c_a), veh/h	178	2621	1412	178	3932	1215	179	1331	1374	405	2722	1189
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.1	12.0	12.1	28.2	15.9	12.6	27.1	22.1	22.2	26.5	21.4	22.9
Incr Delay (d2), s/veh	109.0	0.0	0.1	5.5	0.1	0.0	201.4	0.1	0.1	36.4	0.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	1.7	1.8	1.1	3.7	0.4	12.3	0.6	0.6	4.5	0.6	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	136.0	12.1	12.2	33.7	16.0	12.7	228.5	22.3	22.3	62.8	21.4	23.6
LnGrp LOS	F	B	B	C	B	B	F	C	C	E	C	C
Approach Vol, veh/h	907		1316				354			659		
Approach Delay, s/veh	39.7		16.9				166.2			46.6		
Approach LOS	D		B				F			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.3	7.1	28.8	10.0	14.3	10.0	25.9					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	6.0	45.0	6.0	44.4	6.0	45.0					
Max Q Clear Time (g_c+1/3), s	3.6	4.4	7.5	8.0	7.3	8.0	13.6					
Green Ext Time (p_c), s	0.0	0.3	0.0	2.7	0.0	0.6	0.0	5.9				

### Intersection Summary

HCM 6th Ctrl Delay 45.6  
HCM 6th LOS D

# HCM 6th Signalized Intersection Summary 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1135	490	160	1387	0	0	0	0	420	0	620
Future Volume (veh/h)	0	1135	490	160	1387	0	0	0	0	420	0	620
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1234	137	174	1508	0				457	0	645
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	1	1	0				2	2	2
Cap, veh/h	0	1636	507	214	2419	0				1575	0	701
Arrive On Green	0.00	0.32	0.32	0.11	0.47	0.00				0.44	0.00	0.44
Sat Flow, veh/h	0	5316	1596	1975	5316	0				3563	0	1585
Grp Volume(v), veh/h	0	1234	137	174	1508	0				457	0	645
Grp Sat Flow(s),veh/h/ln	0	1716	1596	987	1716	0				1781	0	1585
Q Serve(g_s), s	0.0	19.6	5.8	7.8	20.0	0.0				7.5	0.0	34.9
Cycle Q Clear(g_c), s	0.0	19.6	5.8	7.8	20.0	0.0				7.5	0.0	34.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1636	507	214	2419	0				1575	0	701
V/C Ratio(X)	0.00	0.75	0.27	0.81	0.62	0.00				0.29	0.00	0.92
Avail Cap(c_a), veh/h	0	2599	806	347	3729	0				2581	0	1148
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	27.9	23.2	39.7	18.1	0.0				16.3	0.0	23.9
Incr Delay (d2), s/veh	0.0	0.3	0.1	2.9	0.1	0.0				0.0	0.0	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.5	2.1	1.9	7.0	0.0				2.8	0.0	12.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	28.2	23.3	42.7	18.2	0.0				16.3	0.0	28.9
LnGrp LOS	A	C	C	D	B	A				B	A	C
Approach Vol, veh/h		1371			1682						1102	
Approach Delay, s/veh		27.7			20.7						23.7	
Approach LOS		C			C						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	3.9	32.9		44.3		46.8						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	6.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I), s	19.8	21.6		36.9		22.0						
Green Ext Time (p_c), s	0.1	6.0		2.1		8.4						

## Intersection Summary

HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C

## Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↑	↑	↑↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1125	420	150	947	530	610	30	280	0	0	0
Future Volume (veh/h)	0	1125	420	150	947	530	610	30	280	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	0	1223	144	163	1029	304	687	0	139			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2			
Cap, veh/h	0	1994	618	207	2970	897	958	0	426			
Arrive On Green	0.00	0.39	0.39	0.12	0.58	0.58	0.27	0.00	0.27			
Sat Flow, veh/h	0	5274	1583	1781	5106	1542	3563	0	1583			
Grp Volume(v), veh/h	0	1223	144	163	1029	304	687	0	139			
Grp Sat Flow(s),veh/h/ln	0	1702	1583	1781	1702	1542	1781	0	1583			
Q Serve(g_s), s	0.0	10.3	3.3	4.8	5.7	5.5	9.4	0.0	3.8			
Cycle Q Clear(g_c), s	0.0	10.3	3.3	4.8	5.7	5.5	9.4	0.0	3.8			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	1994	618	207	2970	897	958	0	426			
V/C Ratio(X)	0.00	0.61	0.23	0.79	0.35	0.34	0.72	0.00	0.33			
Avail Cap(c_a), veh/h	0	4577	1419	366	6007	1814	3260	0	1449			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	13.1	10.9	23.0	5.9	5.8	17.7	0.0	15.7			
Incr Delay (d2), s/veh	0.0	0.1	0.1	2.5	0.0	0.1	0.4	0.0	0.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	3.0	0.9	1.9	1.2	1.0	3.2	0.0	1.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	13.2	11.0	25.5	5.9	5.9	18.1	0.0	15.8			
LnGrp LOS	A	B	B	C	A	A	B	A	B			
Approach Vol, veh/h	1367		1496			826						
Approach Delay, s/veh	13.0		8.0			17.7						
Approach LOS	B		A			B						
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), \$0.2	24.9		18.4		35.1							
Change Period (Y+Rc), s	4.0	5.3	5.3		5.3							
Max Green Setting (Gmax), s	1.0	46.7	47.7		61.7							
Max Q Clear Time (g_c+I10), s	10.0	12.3	11.4		7.7							
Green Ext Time (p_c), s	0.1	6.3	1.5		5.6							

### Intersection Summary

HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.











# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	90	12	15	60	348	12	286	22	250	170	20
Future Volume (veh/h)	40	90	12	15	60	348	12	286	22	250	170	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	48	107	9	18	71	229	14	340	19	298	202	16
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	122	438	37	121	97	313	123	695	39	357	1117	88
Arrive On Green	0.07	0.26	0.26	0.07	0.26	0.26	0.07	0.20	0.18	0.20	0.33	0.31
Sat Flow, veh/h	1781	1699	143	1767	377	1216	1795	3441	191	1795	3360	264
Grp Volume(v), veh/h	48	0	116	18	0	300	14	176	183	298	107	111
Grp Sat Flow(s),veh/h/ln	1781	0	1842	1767	0	1594	1795	1791	1841	1795	1791	1833
Q Serve(g_s), s	1.5	0.0	2.9	0.6	0.0	10.1	0.4	5.1	5.2	9.3	2.5	2.5
Cycle Q Clear(g_c), s	1.5	0.0	2.9	0.6	0.0	10.1	0.4	5.1	5.2	9.3	2.5	2.5
Prop In Lane	1.00		0.08	1.00		0.76	1.00		0.10	1.00		0.14
Lane Grp Cap(c), veh/h	122	0	474	121	0	410	123	362	372	357	595	609
V/C Ratio(X)	0.39	0.00	0.24	0.15	0.00	0.73	0.11	0.49	0.49	0.84	0.18	0.18
Avail Cap(c_a), veh/h	335	0	1133	332	0	981	644	1561	1605	644	1561	1598
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	0.0	17.2	25.7	0.0	19.9	25.6	20.7	20.8	22.5	13.9	14.0
Incr Delay (d2), s/veh	0.8	0.0	0.1	0.2	0.0	0.9	0.2	0.4	0.4	2.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	1.1	0.2	0.0	3.2	0.2	1.9	1.9	3.6	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.9	0.0	17.3	25.9	0.0	20.8	25.7	21.0	21.1	24.5	13.9	14.0
LnGrp LOS	C	A	B	C	A	C	C	C	C	C	B	B
Approach Vol, veh/h	164				318				373		516	
Approach Delay, s/veh	20.1				21.1				21.3		20.1	
Approach LOS	C				C				C		C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), \$5.6	15.8	8.0	19.1	8.0	23.4	8.0	19.1					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	11.0	36.0	21.0	49.7	11.0	36.0					
Max Q Clear Time (g_c+I1), s	7.2	2.6	4.9	2.4	4.5	3.5	12.1					
Green Ext Time (p_c), s	0.3	1.2	0.0	0.3	0.0	0.7	0.0	1.1				

## Intersection Summary









HCM 6th Ctrl Delay	20.6
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Near Term Plus Project AM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	180	182	262	170	150	108	670	215	140	942	60
Future Volume (veh/h)	120	180	182	262	170	150	108	670	215	140	942	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	132	198	165	288	187	135	119	736	209	154	1035	62
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	162	221	184	319	324	234	147	893	254	185	1185	71
Arrive On Green	0.09	0.23	0.23	0.18	0.32	0.32	0.08	0.32	0.31	0.10	0.35	0.33
Sat Flow, veh/h	1795	943	786	1781	1001	722	1795	2750	781	1795	3428	205
Grp Volume(v), veh/h	132	0	363	288	0	322	119	479	466	154	541	556
Grp Sat Flow(s),veh/h/ln	1795	0	1729	1781	0	1723	1795	1791	1740	1795	1791	1842
Q Serve(g_s), s	7.3	0.0	20.5	16.0	0.0	15.7	6.6	24.9	24.9	8.5	28.6	28.6
Cycle Q Clear(g_c), s	7.3	0.0	20.5	16.0	0.0	15.7	6.6	24.9	24.9	8.5	28.6	28.6
Prop In Lane	1.00		0.45	1.00		0.42	1.00		0.45	1.00		0.11
Lane Grp Cap(c), veh/h	162	0	406	319	0	557	147	582	565	185	619	637
V/C Ratio(X)	0.81	0.00	0.89	0.90	0.00	0.58	0.81	0.82	0.82	0.83	0.87	0.87
Avail Cap(c_a), veh/h	267	0	583	353	0	666	160	674	655	214	728	748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.1	0.0	37.4	40.6	0.0	28.4	45.5	31.4	31.7	44.4	30.9	31.0
Incr Delay (d2), s/veh	3.7	0.0	9.6	22.8	0.0	0.4	21.7	6.3	6.5	19.0	9.1	8.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	9.3	8.7	0.0	6.1	3.7	11.1	10.9	4.6	13.0	13.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.8	0.0	47.0	63.4	0.0	28.8	67.2	37.7	38.1	63.4	40.1	39.9
LnGrp LOS	D	A	D	E	A	C	E	D	D	E	D	D
Approach Vol, veh/h	495		610			1064			1251			
Approach Delay, s/veh	47.5		45.1			41.2			42.9			
Approach LOS	D		D			D			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.4	36.8	22.1	27.7	12.3	38.9	13.1	36.6				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	2.0	36.7	20.0	34.0	9.0	39.7	15.0	39.0				
Max Q Clear Time (g_c+I10), s	10.5	26.9	18.0	22.5	8.6	30.6	9.3	17.7				
Green Ext Time (p_c), s	0.0	2.7	0.1	1.0	0.0	3.0	0.1	1.1				
Intersection Summary												
HCM 6th Ctrl Delay			43.4									
HCM 6th LOS			D									

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	182	0	41	23	0	60	3	801	43	330	1022	63
Future Volume (veh/h)	182	0	41	23	0	60	3	801	43	330	1022	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	0	1900	1870	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	198	0	4	26	0	0	3	921	12	379	1175	66
Peak Hour Factor	0.92	0.92	0.92	0.87	0.92	0.87	0.92	0.87	0.87	0.87	0.87	0.92
Percent Heavy Veh, %	2	2	2	0	0	0	2	1	1	1	1	1
Cap, veh/h	260	0	145	69	0	0	23	1253	544	438	2003	112
Arrive On Green	0.15	0.00	0.08	0.04	0.00	0.00	0.01	0.35	0.35	0.24	0.58	0.56
Sat Flow, veh/h	1781	0	1585	1810	26		1781	3582	1555	1795	3448	194
Grp Volume(v), veh/h	198	0	4	26	30.5		3	921	12	379	610	631
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1810	C		1781	1791	1555	1795	1791	1850
Q Serve(g_s), s	6.2	0.0	0.1	0.8			0.1	13.0	0.3	11.7	12.5	12.6
Cycle Q Clear(g_c), s	6.2	0.0	0.1	0.8			0.1	13.0	0.3	11.7	12.5	12.6
Prop In Lane	1.00		1.00	1.00			1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	260	0	145	69			23	1253	544	438	1041	1075
V/C Ratio(X)	0.76	0.00	0.03	0.38			0.13	0.73	0.02	0.87	0.59	0.59
Avail Cap(c_a), veh/h	339	0	1082	172			169	2104	914	776	1656	1710
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.7	0.0	24.2	27.2			28.3	16.5	12.3	21.0	7.7	7.8
Incr Delay (d2), s/veh	7.2	0.0	0.1	3.4			2.6	0.3	0.0	2.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.1	0.4			0.1	4.3	0.1	4.4	3.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	0.0	24.2	30.5			30.9	16.8	12.3	23.0	7.9	8.0
LnGrp LOS	C	A	C	C			C	B	B	C	A	A
Approach Vol, veh/h	202						936				1620	
Approach Delay, s/veh	30.8						16.8				11.5	
Approach LOS	C						B				B	
Timer - Assigned Phs	1	2	3	4	5	6	7					
Phs Duration (G+Y+Rc), s	8.1	24.3	6.2	9.3	4.7	37.6	12.5					
Change Period (Y+Rc), s	4.0	5.3	4.5	4.5	4.5	5.3	4.5					
Max Green Setting (Gmax), s	25.0	32.7	5.0	39.0	5.0	52.2	10.5					
Max Q Clear Time (g_c+I1), s	13.8	15.0	2.8	2.1	2.1	14.6	8.2					
Green Ext Time (p_c), s	0.4	3.7	0.0	0.0	0.0	5.3	0.1					

### Intersection Summary










HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	0	39	90	0	350	32	363	50	420	521	35
Future Volume (veh/h)	84	0	39	90	0	350	32	363	50	420	521	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	104	0	0	111	0	0	40	448	51	519	643	39
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	181	5	4	185	5	0	65	806	91	609	1888	114
Arrive On Green	0.10	0.00	0.00	0.10	0.00	0.00	0.04	0.25	0.21	0.34	0.55	0.52
Sat Flow, veh/h	1810	1900	1610	1795	1885	0	1810	3260	369	1795	3431	208
Grp Volume(v), veh/h	104	0	0	111	0	0	40	247	252	519	335	347
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1795	1885	0	1810	1805	1824	1795	1791	1848
Q Serve(g_s), s	2.1	0.0	0.0	2.3	0.0	0.0	0.8	4.6	4.7	10.4	4.0	4.0
Cycle Q Clear(g_c), s	2.1	0.0	0.0	2.3	0.0	0.0	0.8	4.6	4.7	10.4	4.0	4.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.20	1.00		0.11
Lane Grp Cap(c), veh/h	181	5	4	185	5	0	65	446	451	609	986	1017
V/C Ratio(X)	0.58	0.00	0.00	0.60	0.00	0.00	0.61	0.55	0.56	0.85	0.34	0.34
Avail Cap(c_a), veh/h	473	1878	1591	321	1707	0	281	1303	1316	1440	2451	2529
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.6	0.0	0.0	16.6	0.0	0.0	18.4	12.7	12.8	11.9	4.8	4.9
Incr Delay (d2), s/veh	2.9	0.0	0.0	3.1	0.0	0.0	3.4	0.4	0.4	1.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	0.9	0.0	0.0	0.3	1.3	1.4	3.3	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.5	0.0	0.0	19.7	0.0	0.0	21.8	13.1	13.2	13.2	4.9	4.9
LnGrp LOS	B	A	A	B	A	A	C	B	B	B	A	A
Approach Vol, veh/h	104			111			539			1201		
Approach Delay, s/veh	19.5			19.7			13.8			8.5		
Approach LOS	B			B			B			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	13.6	8.0	0.0	5.4	25.3	7.9	0.1				
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0				
Max Green Setting (Gmax), s	11.0	26.6	6.4	38.2	6.0	51.6	9.6	35.0				
Max Q Clear Time (g_c+I1), s	12.4	6.7	4.3	0.0	2.8	6.0	4.1	0.0				
Green Ext Time (p_c), s	0.8	1.6	0.0	0.0	0.0	2.9	0.1	0.0				

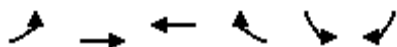
### Intersection Summary

HCM 6th Ctrl Delay	11.2
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 18: Sand Creek Road & Hillcrest Avenue

The Ranch  
Near Term Plus Project AM Peak Hour

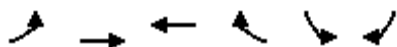







Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	60	50	86	320	10
Future Volume (veh/h)	0	60	50	86	320	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	65	54	2	348	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	467	581	572	21	565	503
Arrive On Green	0.00	0.16	0.16	0.13	0.32	0.32
Sat Flow, veh/h	1348	3647	3589	129	1781	1585
Grp Volume(v), veh/h	0	65	27	29	348	9
Grp Sat Flow(s), veh/h/ln	1348	1777	1777	1847	1781	1585
Q Serve(g_s), s	0.0	0.2	0.2	0.2	2.6	0.1
Cycle Q Clear(g_c), s	0.0	0.2	0.2	0.2	2.6	0.1
Prop In Lane	1.00			0.07	1.00	1.00
Lane Grp Cap(c), veh/h	467	581	291	302	565	503
V/C Ratio(X)	0.00	0.11	0.09	0.09	0.62	0.02
Avail Cap(c_a), veh/h	3273	7981	3990	4148	4324	3848
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	5.5	5.5	5.5	4.5	3.6
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.1	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	5.6	5.6	5.6	5.6	3.6
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		65	56		357	
Approach Delay, s/veh		5.6	5.6		5.5	
Approach LOS		A	A		A	
Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			6.5		8.9	6.5
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			34.1		36.9	34.1
Max Q Clear Time (g_c+I1), s			2.2		4.6	2.2
Green Ext Time (p_c), s			0.3		1.0	0.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			5.5			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

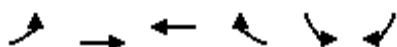
The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	380	126	130	200	10
Future Volume (veh/h)	0	380	126	130	200	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	413	137	19	217	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	3	679	600	82	1209	1076
Arrive On Green	0.00	0.19	0.19	0.18	0.68	0.68
Sat Flow, veh/h	1781	3647	3235	429	1781	1585
Grp Volume(v), veh/h	0	413	76	80	217	7
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1793	1781	1585
Q Serve(g_s), s	0.0	6.5	2.2	2.3	2.7	0.1
Cycle Q Clear(g_c), s	0.0	6.5	2.2	2.3	2.7	0.1
Prop In Lane	1.00			0.24	1.00	1.00
Lane Grp Cap(c), veh/h	3	679	339	342	1209	1076
V/C Ratio(X)	0.00	0.61	0.23	0.23	0.18	0.01
Avail Cap(c_a), veh/h	911	4616	1284	1296	1209	1076
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	22.7	21.0	21.1	3.6	3.2
Incr Delay (d2), s/veh	0.0	0.9	0.3	0.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.5	0.8	0.9	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	23.6	21.3	21.4	3.9	3.2
LnGrp LOS	A	C	C	C	A	A
Approach Vol, veh/h		413	156		224	
Approach Delay, s/veh		23.6	21.4		3.9	
Approach LOS		C	C		A	
Timer - Assigned Phs						
			4		6	7 8
Phs Duration (G+Y+Rc), s			15.7		45.7	0.0 15.7
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			79.3		41.2	30.9 43.9
Max Q Clear Time (g_c+I1), s			8.5		4.7	0.0 4.3
Green Ext Time (p_c), s			2.7		0.6	0.0 0.8
Intersection Summary						
HCM 6th Ctrl Delay			17.6			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	249	381	182	370	810	35
Future Volume (veh/h)	249	381	182	370	810	35
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	293	448	214	134	953	10
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	561	843	843	714	1260	578
Arrive On Green	0.45	0.45	0.45	0.45	0.36	0.36
Sat Flow, veh/h	1033	1870	1870	1585	3483	1598
Grp Volume(v), veh/h	293	448	214	134	953	10
Grp Sat Flow(s), veh/h/ln	1033	1870	1870	1585	1742	1598
Q Serve(g_s), s	10.5	7.4	3.0	2.2	10.3	0.2
Cycle Q Clear(g_c), s	13.5	7.4	3.0	2.2	10.3	0.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	561	843	843	714	1260	578
V/C Ratio(X)	0.52	0.53	0.25	0.19	0.76	0.02
Avail Cap(c_a), veh/h	1451	2455	2455	2080	2939	1348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	8.5	7.3	7.0	12.0	8.7
Incr Delay (d2), s/veh	0.3	0.2	0.1	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	1.8	0.7	0.4	2.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.7	8.7	7.3	7.1	12.3	8.7
LnGrp LOS	B	A	A	A	B	A
Approach Vol, veh/h		741	348		963	
Approach Delay, s/veh		9.9	7.2		12.3	
Approach LOS		A	A		B	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		23.2			23.2	19.4
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		54.7			54.7	34.7
Max Q Clear Time (g_c+I1), s		15.5			5.0	12.3
Green Ext Time (p_c), s		2.4			0.9	1.9
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			10.6			
HCM 6th LOS			B			










# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	1056	0	0	384	1040	118	0	160	0	0	0
Future Volume (veh/h)	175	1056	0	0	384	1040	118	0	160	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	180	1089	0	0	396	720	122	0	87			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	347	3114	0	0	718	1217	515	0	229			
Arrive On Green	0.10	0.61	0.00	0.00	0.38	0.38	0.15	0.00	0.15			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	180	1089	0	0	396	720	122	0	87			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	1.6	3.4	0.0	0.0	5.3	5.8	1.0	0.0	1.6			
Cycle Q Clear(g_c), s	1.6	3.4	0.0	0.0	5.3	5.8	1.0	0.0	1.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	347	3114	0	0	718	1217	515	0	229			
V/C Ratio(X)	0.52	0.35	0.00	0.00	0.55	0.59	0.24	0.00	0.38			
Avail Cap(c_a), veh/h	1736	12023	0	0	3230	5474	5174	0	2302			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	13.7	3.2	0.0	0.0	7.8	7.9	12.1	0.0	12.4			
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.0	0.2	0.2	0.1	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.0	1.0	0.9	0.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.2	3.2	0.0	0.0	8.0	8.1	12.2	0.0	12.8			
LnGrp LOS	B	A	A	A	A	A	B	A	B			
Approach Vol, veh/h	1269			1116			209					
Approach Delay, s/veh	4.8			8.1			12.5					
Approach LOS	A			A			B					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	23.4			8.7		7.2	16.2					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	73.7			45.7		16.0	53.7					
Max Q Clear Time (g_c+I1), s	5.4			3.6		3.6	7.8					
Green Ext Time (p_c), s	5.3			0.3		0.2	3.1					

### Intersection Summary




HCM 6th Ctrl Delay	6.8
HCM 6th LOS	A

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Near Term Plus Project AM Peak Hour

Intersection						
Int Delay, s/veh	33.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	391	44	30	461	110
Future Vol, veh/h	80	391	44	30	461	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	85	416	47	32	490	117
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1160	63	0	0	79	0
Stage 1	63	-	-	-	-	-
Stage 2	1097	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	218	1007	-	-	1532	-
Stage 1	965	-	-	-	-	-
Stage 2	323	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	143	1007	-	-	1532	-
Mov Cap-2 Maneuver	143	-	-	-	-	-
Stage 1	965	-	-	-	-	-
Stage 2	213	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	71.4	0	6.8			
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	497	1532	-	
HCM Lane V/C Ratio	-	-	1.008	0.32	-	
HCM Control Delay (s)	-	-	71.4	8.5	0	
HCM Lane LOS	-	-	F	A	A	
HCM 95th %tile Q(veh)	-	-	14	1.4	-	

# HCM 6th Signalized Intersection Summary

## 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Near Term Plus Project AM Peak Hour



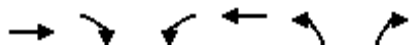
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↱	↕	↕↕↕	↰	↰	↰↱	
Traffic Volume (veh/h)	245	1270	765	80	380	790	
Future Volume (veh/h)	245	1270	765	80	380	790	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1870	1870	1796	1796	
Adj Flow Rate, veh/h	266	1380	832	0	413	538	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	1	1	2	2	7	7	
Cap, veh/h	324	1537	1524		848	1329	
Arrive On Green	0.09	0.43	0.30	0.00	0.50	0.50	
Sat Flow, veh/h	3483	3676	5274	1585	1711	2679	
Grp Volume(v), veh/h	266	1380	832	0	413	538	
Grp Sat Flow(s),veh/h/ln	1742	1791	1702	1585	1711	1340	
Q Serve(g_s), s	9.0	42.9	16.4	0.0	19.2	15.2	
Cycle Q Clear(g_c), s	9.0	42.9	16.4	0.0	19.2	15.2	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	324	1537	1524		848	1329	
V/C Ratio(X)	0.82	0.90	0.55		0.49	0.40	
Avail Cap(c_a), veh/h	421	1955	1979		848	1329	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	53.4	31.8	35.3	0.0	20.1	19.1	
Incr Delay (d2), s/veh	7.5	4.3	0.1	0.0	0.2	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	4.2	18.3	6.6	0.0	7.6	13.5	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	60.9	36.1	35.4	0.0	20.3	19.1	
LnGrp LOS	E	D	D		C	B	
Approach Vol, veh/h		1646	832	A	951		
Approach Delay, s/veh		40.2	35.4		19.6		
Approach LOS		D	D		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				56.0	64.0	15.7	40.3
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				65.5	45.5	14.5	46.5
Max Q Clear Time (g_c+I1), s				44.9	21.2	11.0	18.4
Green Ext Time (p_c), s				6.5	1.9	0.2	3.6
Intersection Summary							
HCM 6th Ctrl Delay			33.3				
HCM 6th LOS			C				

### Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Near Term Plus Project AM Peak Hour














Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑	↘↘	↗
Traffic Volume (veh/h)	1020	630	0	1385	120	20
Future Volume (veh/h)	1020	630	0	1385	120	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1109	385	0	1505	130	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1804	805	0	1804	1471	675
Arrive On Green	0.51	0.51	0.00	0.51	0.43	0.43
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1109	385	0	1505	130	6
Grp Sat Flow(s),veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	26.8	19.0	0.0	43.4	2.7	0.3
Cycle Q Clear(g_c), s	26.8	19.0	0.0	43.4	2.7	0.3
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1804	805	0	1804	1471	675
V/C Ratio(X)	0.61	0.48	0.00	0.83	0.09	0.01
Avail Cap(c_a), veh/h	2636	1176	0	2636	1471	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	19.2	0.0	25.2	20.6	19.9
Incr Delay (d2), s/veh	0.3	0.4	0.0	1.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	7.0	0.0	17.2	1.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.5	19.7	0.0	26.8	20.7	19.9
LnGrp LOS	C	B	A	C	C	B
Approach Vol, veh/h	1494			1505	136	
Approach Delay, s/veh	21.0			26.8	20.6	
Approach LOS	C			C	C	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	55.1		64.9		64.9	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	22.5		88.5		88.5	
Max Q Clear Time (g_c+I1), s	4.7		28.8		45.4	
Green Ext Time (p_c), s	0.4		14.0		15.0	
Intersection Summary						
HCM 6th Ctrl Delay			23.8			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Near Term Plus Project AM Peak Hour





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	215	40	130	0	40	10	39	240	0	10	110	156
Future Volume (veh/h)	215	40	130	0	40	10	39	240	0	10	110	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	250	47	151	0	47	12	45	279	0	12	128	181
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	271	756	640	5	203	52	114	835	373	53	712	318
Arrive On Green	0.15	0.40	0.40	0.00	0.14	0.13	0.06	0.24	0.00	0.03	0.20	0.20
Sat Flow, veh/h	1781	1870	1585	1781	1437	367	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	250	47	151	0	0	59	45	279	0	12	128	181
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1804	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.0	0.6	2.3	0.0	0.0	1.1	0.9	2.4	0.0	0.2	1.1	3.7
Cycle Q Clear(g_c), s	5.0	0.6	2.3	0.0	0.0	1.1	0.9	2.4	0.0	0.2	1.1	3.7
Prop In Lane	1.00		1.00	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	271	756	640	5	0	255	114	835	373	53	712	318
V/C Ratio(X)	0.92	0.06	0.24	0.00	0.00	0.23	0.39	0.33	0.00	0.23	0.18	0.57
Avail Cap(c_a), veh/h	271	956	810	271	0	922	271	1914	854	271	1914	854
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.1	6.6	7.1	0.0	0.0	13.8	16.3	11.5	0.0	17.2	12.0	13.1
Incr Delay (d2), s/veh	35.1	0.0	0.2	0.0	0.0	0.5	2.2	0.2	0.0	2.2	0.1	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.2	0.5	0.0	0.0	0.4	0.3	0.7	0.0	0.1	0.3	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.2	6.6	7.3	0.0	0.0	14.3	18.5	11.7	0.0	19.3	12.1	14.7
LnGrp LOS	D	A	A	A	A	B	B	B	A	B	B	B
Approach Vol, veh/h	448			59			324			321		
Approach Delay, s/veh	31.2			14.3			12.7			13.8		
Approach LOS	C			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.1	12.5	0.0	18.6	6.3	11.3	9.5	9.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+12.2), s	4.4	4.4	0.0	4.3	2.9	5.7	7.0	3.1				
Green Ext Time (p_c), s	0.0	1.3	0.0	0.6	0.0	1.0	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay	20.3											
HCM 6th LOS	C											

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)








The Ranch  
Near Term Plus Project PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	200	0	240	800	791	0	0	642	440
Future Volume (veh/h)	0	0	0	200	0	240	800	791	0	0	642	440
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				204	0	75	816	807	0	0	655	135
Peak Hour Factor				0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %				1	0	1	1	1	0	0	1	1
Cap, veh/h				499	0	229	1057	2341	0	0	1612	396
Arrive On Green				0.14	0.00	0.14	0.30	0.65	0.00	0.00	0.25	0.25
Sat Flow, veh/h				3483	0	1598	3483	3676	0	0	6749	1591
Grp Volume(v), veh/h				204	0	75	816	807	0	0	655	135
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1742	1791	0	0	1621	1591
Q Serve(g_s), s				2.1	0.0	1.7	8.4	4.0	0.0	0.0	3.3	2.7
Cycle Q Clear(g_c), s				2.1	0.0	1.7	8.4	4.0	0.0	0.0	3.3	2.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				499	0	229	1057	2341	0	0	1612	396
V/C Ratio(X)				0.41	0.00	0.33	0.77	0.34	0.00	0.00	0.41	0.34
Avail Cap(c_a), veh/h				3801	0	1743	3978	8090	0	0	6583	1615
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				15.4	0.0	15.2	12.5	3.1	0.0	0.0	12.4	12.2
Incr Delay (d2), s/veh				0.2	0.0	0.3	0.5	0.0	0.0	0.0	0.1	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.6	0.0	0.5	2.2	0.1	0.0	0.0	0.9	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				15.6	0.0	15.5	12.9	3.1	0.0	0.0	12.4	12.3
LnGrp LOS				B	A	B	B	A	A	A	B	B
Approach Vol, veh/h					279			1623			790	
Approach Delay, s/veh					15.5			8.0			12.4	
Approach LOS					B			A			B	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	29.8			16.0			13.8			9.6		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	6.0			10.4			5.3			4.1		
Green Ext Time (p_c), s	3.6			1.6			3.0			0.5		
Intersection Summary												
HCM 6th Ctrl Delay	10.1											
HCM 6th LOS	B											

# HCM 6th Signalized Intersection Summary 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	480	0	1078	0	0	0	0	1111	270	280	632	0
Future Volume (veh/h)	480	0	1078	0	0	0	0	1111	270	280	632	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	500	0	1123				0	1157	249	292	658	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1590	0	1415				0	1597	341	381	1576	0
Arrive On Green	0.44	0.00	0.44				0.00	0.30	0.28	0.11	0.44	0.00
Sat Flow, veh/h	3591	0	3195				0	5651	1150	3483	3676	0
Grp Volume(v), veh/h	500	0	1123				0	1044	362	292	658	0
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1621	1674	1742	1791	0
Q Serve(g_s), s	7.1	0.0	24.0				0.0	15.2	15.5	6.5	10.0	0.0
Cycle Q Clear(g_c), s	7.1	0.0	24.0				0.0	15.2	15.5	6.5	10.0	0.0
Prop In Lane	1.00		1.00				0.00		0.69	1.00		0.00
Lane Grp Cap(c), veh/h	1590	0	1415				0	1442	496	381	1576	0
V/C Ratio(X)	0.31	0.00	0.79				0.00	0.72	0.73	0.77	0.42	0.00
Avail Cap(c_a), veh/h	3848	0	3424				0	1840	633	571	2122	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.3	0.0	19.0				0.0	25.0	25.5	34.3	15.2	0.0
Incr Delay (d2), s/veh	0.1	0.0	1.0				0.0	0.7	2.1	1.5	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	7.7				0.0	5.4	5.9	2.6	3.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	0.0	20.0				0.0	25.7	27.5	35.9	15.3	0.0
LnGrp LOS	B	A	C				A	C	C	D	B	A
Approach Vol, veh/h	1623						1406			950		
Approach Delay, s/veh	18.3						26.1			21.6		
Approach LOS	B						C			C		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	27.5	27.5	39.1	40.2								
Change Period (Y+Rc), s	4.0	5.3	4.5	* 5.3								
Max Green Setting (Gmax), s	30.0	28.7	84.5	* 47								
Max Q Clear Time (g_c+I), s	10.5	17.5	26.0	12.0								
Green Ext Time (p_c), s	0.2	4.7	8.7	2.7								

## Intersection Summary

HCM 6th Ctrl Delay	21.9
HCM 6th LOS	C

## Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.


















# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Near Term Plus Project PM Peak Hour

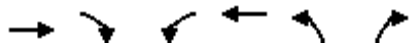


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	  		 	
Traffic Volume (veh/h)	30	20	110	844	100	170	170	580	900	50	550	30
Future Volume (veh/h)	30	20	110	844	100	170	170	580	900	50	550	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	21	14	870	103	135	175	598	304	52	567	28
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	50	92	61	1150	212	279	225	1048	811	138	848	42
Arrive On Green	0.03	0.09	0.08	0.23	0.29	0.28	0.13	0.29	0.29	0.08	0.25	0.23
Sat Flow, veh/h	1781	1040	693	5023	734	963	1781	3554	2751	1781	3447	170
Grp Volume(v), veh/h	31	0	35	870	0	238	175	598	304	52	292	303
Grp Sat Flow(s),veh/h/ln	1781	0	1733	1674	0	1697	1781	1777	1376	1781	1777	1840
Q Serve(g_s), s	0.9	0.0	1.0	8.3	0.0	6.0	4.9	7.4	4.5	1.4	7.6	7.7
Cycle Q Clear(g_c), s	0.9	0.0	1.0	8.3	0.0	6.0	4.9	7.4	4.5	1.4	7.6	7.7
Prop In Lane	1.00		0.40	1.00		0.57	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	50	0	153	1150	0	491	225	1048	811	138	437	453
V/C Ratio(X)	0.63	0.00	0.23	0.76	0.00	0.48	0.78	0.57	0.37	0.38	0.67	0.67
Avail Cap(c_a), veh/h	346	0	1110	1949	0	1416	795	4619	3576	138	1655	1713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	0.0	22.0	18.5	0.0	15.3	21.8	15.4	14.4	22.6	17.5	17.6
Incr Delay (d2), s/veh	4.7	0.0	0.3	0.4	0.0	0.3	2.2	0.2	0.1	0.6	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.4	2.7	0.0	1.9	1.9	2.4	1.1	0.5	2.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.5	0.0	22.3	18.9	0.0	15.6	24.0	15.6	14.5	23.2	18.2	18.2
LnGrp LOS	C	A	C	B	A	B	C	B	B	C	B	B
Approach Vol, veh/h	66		1108				1077			647		
Approach Delay, s/veh	25.7		18.2				16.7			18.6		
Approach LOS	C		B				B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	19.2	15.8	8.5	10.5	16.7	5.4	18.9				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	66.1	20.0	32.4	23.0	47.1	10.0	42.4				
Max Q Clear Time (g_c+I), s	13.4	9.4	10.3	3.0	6.9	9.7	2.9	8.0				
Green Ext Time (p_c), s	0.0	3.2	1.5	0.1	0.2	2.0	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay				17.9								
HCM 6th LOS				B								

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	250	700	50	510	544	120
Future Volume (veh/h)	250	700	50	510	544	120
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	260	256	52	531	567	30
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	1006	445	254	907	840	385
Arrive On Green	0.29	0.29	0.07	0.49	0.25	0.25
Sat Flow, veh/h	3589	1546	3401	1841	3401	1560
Grp Volume(v), veh/h	260	256	52	531	567	30
Grp Sat Flow(s),veh/h/ln	1749	1546	1700	1841	1700	1560
Q Serve(g_s), s	1.8	4.3	0.4	6.3	4.6	0.5
Cycle Q Clear(g_c), s	1.8	4.3	0.4	6.3	4.6	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1006	445	254	907	840	385
V/C Ratio(X)	0.26	0.58	0.20	0.59	0.68	0.08
Avail Cap(c_a), veh/h	3987	1763	620	2674	1927	884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.4	9.3	13.3	5.6	10.4	8.9
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.8	0.1	0.6	1.2	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.5	9.8	13.7	5.8	10.8	8.9
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	516			583	597	
Approach Delay, s/veh	9.1			6.5	10.7	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		11.6	6.3	12.8		19.1
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		17.4	5.1	34.4		44.0
Max Q Clear Time (g_c+I1), s		6.6	2.4	6.3		8.3
Green Ext Time (p_c), s		1.0	0.0	1.4		1.9
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			8.8			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	🔴🔴		🔴🔴🔴					🔴🔴🔴		🔴🔴	🔴🔴🔴	
Traffic Volume (veh/h)	320	30	1516	0	0	0	30	1250	466	350	884	0
Future Volume (veh/h)	320	30	1516	0	0	0	30	1250	466	350	884	0
Initial Q (Qb), veh	0	0	20				0	20	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No					No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				1885	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	327	31	1136				31	1276	423	357	902	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1				1	1	1	1	1	0
Cap, veh/h	938	0	697				65	1776	533	437	3333	0
Arrive On Green	0.30	0.30	0.30				0.42	0.42	0.41	0.13	0.61	0.00
Sat Flow, veh/h	3483	0	3643				52	3963	1300	3483	5316	0
Grp Volume(v), veh/h	327	0	1136				580	669	481	357	902	0
Grp Sat Flow(s),veh/h/ln	1742	0	1214				1779	1029	1478	1742	1716	0
Q Serve(g_s), s	6.3	0.0	26.0				7.9	24.1	24.2	8.6	7.2	0.0
Cycle Q Clear(g_c), s	6.3	0.0	26.0				23.3	24.1	24.2	8.6	7.2	0.0
Prop In Lane	1.00		1.00				0.05		0.88	1.00		0.00
Lane Grp Cap(c), veh/h	938	0	697				806	894	638	437	3333	0
V/C Ratio(X)	0.35	0.00	1.63				0.72	0.75	0.75	0.82	0.27	0.00
Avail Cap(c_a), veh/h	1048	0	1096				1671	1929	1385	846	4823	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.7	0.0	55.0				21.2	21.9	22.0	43.0	7.3	0.0
Incr Delay (d2), s/veh	0.1	0.0	290.3				0.5	0.5	0.7	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	103.3				1.0	3.6	1.8	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	33.1				9.9	6.5	8.8	4.2	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	0.0	448.6				22.7	25.9	24.5	44.4	7.3	0.0
LnGrp LOS	C	A	F				C	C	C	D	A	A
Approach Vol, veh/h		1463						1730			1259	
Approach Delay, s/veh		355.2						24.5			17.8	
Approach LOS		F						C			B	
Timer - Assigned Phs	1	2		4			6					
Phs Duration (G+Y+Rc), s	6.0	40.4		30.0			56.4					
Change Period (Y+Rc), s	4.9	* 4.9		5.3			4.9					
Max Green Setting (Gmax), s	1.0	* 80		24.7			80.1					
Max Q Clear Time (g_c+I10), s	11.0	26.2		28.0			9.2					
Green Ext Time (p_c), s	0.5	9.3		0.0			4.2					

### Intersection Summary

HCM 6th Ctrl Delay 131.3  
HCM 6th LOS F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Contra Loma Plaza/Davison Drive

The Ranch  
Near Term Plus Project PM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↱	↰	↰		↰	↰	↰
Traffic Volume (veh/h)	60	50	60	160	30	130	60	1001	140	200	1330	30
Future Volume (veh/h)	60	50	60	160	30	130	60	1001	140	200	1330	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	61	51	7	163	31	20	61	1021	138	204	1357	30
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	103	86	163	237	249	211	78	1373	185	309	1717	38
Arrive On Green	0.10	0.10	0.10	0.13	0.13	0.13	0.04	0.43	0.42	0.09	0.48	0.47
Sat Flow, veh/h	1000	836	1574	1795	1885	1594	1795	3165	427	3483	3582	79
Grp Volume(v), veh/h	112	0	7	163	31	20	61	577	582	204	678	709
Grp Sat Flow(s), veh/h/ln	1835	0	1574	1795	1885	1594	1795	1791	1802	1742	1791	1871
Q Serve(g_s), s	3.9	0.0	0.3	5.7	1.0	0.7	2.2	17.8	17.9	3.8	21.0	21.0
Cycle Q Clear(g_c), s	3.9	0.0	0.3	5.7	1.0	0.7	2.2	17.8	17.9	3.8	21.0	21.0
Prop In Lane	0.54		1.00	1.00		1.00	1.00		0.24	1.00		0.04
Lane Grp Cap(c), veh/h	190	0	163	237	249	211	78	777	782	309	858	896
V/C Ratio(X)	0.59	0.00	0.04	0.69	0.12	0.09	0.78	0.74	0.74	0.66	0.79	0.79
Avail Cap(c_a), veh/h	971	0	833	1031	1082	915	434	2030	2042	842	2030	2120
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	0.0	26.7	27.4	25.3	25.2	31.3	15.7	15.7	29.2	14.4	14.5
Incr Delay (d2), s/veh	1.1	0.0	0.0	1.3	0.1	0.1	6.3	0.5	0.5	0.9	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.1	2.3	0.4	0.3	1.0	5.9	6.0	1.5	7.4	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	0.0	26.8	28.7	25.4	25.3	37.6	16.2	16.3	30.1	15.1	15.1
LnGrp LOS	C	A	C	C	C	C	D	B	B	C	B	B
Approach Vol, veh/h		119			214			1220			1591	
Approach Delay, s/veh		29.3			27.9			17.3			17.0	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	32.7		10.8	6.9	35.7		12.8				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+1.5), s	15.8	19.9		5.9	4.2	23.0		7.7				
Green Ext Time (p_c), s	0.3	4.9		0.3	0.0	8.1		0.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			18.3									
HCM 6th LOS			B									

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	190	110	70	110	640	120	816	60	900	1040	170
Future Volume (veh/h)	170	190	110	70	110	640	120	816	60	900	1040	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	175	196	55	72	113	660	124	841	59	928	1072	100
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	204	739	202	92	730	1291	326	979	69	906	1275	725
Arrive On Green	0.11	0.27	0.26	0.05	0.20	0.20	0.18	0.29	0.28	0.26	0.36	0.35
Sat Flow, veh/h	1795	2779	760	1795	3582	2812	1795	3394	238	3483	3582	1576
Grp Volume(v), veh/h	175	124	127	72	113	660	124	444	456	928	1072	100
Grp Sat Flow(s),veh/h/ln	1795	1791	1748	1795	1791	1406	1795	1791	1841	1742	1791	1576
Q Serve(g_s), s	11.4	6.5	6.8	4.7	3.1	19.8	7.2	27.9	27.9	31.0	32.8	1.9
Cycle Q Clear(g_c), s	11.4	6.5	6.8	4.7	3.1	19.8	7.2	27.9	27.9	31.0	32.8	1.9
Prop In Lane	1.00		0.43	1.00		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	204	476	465	92	730	1291	326	516	531	906	1275	725
V/C Ratio(X)	0.86	0.26	0.27	0.78	0.15	0.51	0.38	0.86	0.86	1.02	0.84	0.14
Avail Cap(c_a), veh/h	331	1082	1056	166	1834	2157	326	752	773	906	2104	1090
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.9	34.5	34.7	55.9	39.0	22.8	42.9	40.1	40.2	44.1	35.3	6.8
Incr Delay (d2), s/veh	6.5	0.1	0.1	5.3	0.0	0.1	0.3	4.9	4.8	36.2	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	2.8	2.8	2.2	1.3	6.2	3.2	12.5	12.8	17.8	14.2	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.4	34.6	34.8	61.1	39.0	22.9	43.1	45.0	45.0	80.2	36.0	6.9
LnGrp LOS	E	C	C	E	D	C	D	D	D	F	D	A
Approach Vol, veh/h	426			845			1024			2100		
Approach Delay, s/veh	44.4			28.3			44.8			54.1		
Approach LOS	D			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	35.0	38.4	10.1	35.7	26.9	46.4	17.5	28.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	31.0	48.7	11.0	71.4	11.0	* 69	22.0	60.4				
Max Q Clear Time (g_c+Q_c), s	33.0	29.9	6.7	8.8	9.2	34.8	13.4	21.8				
Green Ext Time (p_c), s	0.0	3.1	0.0	0.8	0.0	6.3	0.1	1.9				

### Intersection Summary

HCM 6th Ctrl Delay 46.1

HCM 6th LOS D

### Notes












\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	80	842	10	40	60	541	971	10	60	1350	180
Future Volume (veh/h)	160	80	842	10	40	60	541	971	10	60	1350	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	126	143	100	11	42	3	569	1022	6	63	1421	178
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	219	230	390	15	58	62	688	2041	888	81	1884	236
Arrive On Green	0.12	0.12	0.12	0.04	0.04	0.04	0.20	0.57	0.57	0.04	0.41	0.40
Sat Flow, veh/h	1795	1885	3195	387	1479	1598	3483	3582	1558	1795	4624	579
Grp Volume(v), veh/h	126	143	100	53	0	3	569	1022	6	63	1054	545
Grp Sat Flow(s),veh/h/ln	1795	1885	1598	1866	0	1598	1742	1791	1558	1795	1716	1772
Q Serve(g_s), s	4.7	5.1	2.0	2.0	0.0	0.1	11.2	12.3	0.1	2.5	18.8	18.8
Cycle Q Clear(g_c), s	4.7	5.1	2.0	2.0	0.0	0.1	11.2	12.3	0.1	2.5	18.8	18.8
Prop In Lane	1.00		1.00	0.21		1.00	1.00		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	219	230	390	73	0	62	688	2041	888	81	1398	722
V/C Ratio(X)	0.57	0.62	0.26	0.73	0.00	0.05	0.83	0.50	0.01	0.78	0.75	0.75
Avail Cap(c_a), veh/h	554	581	985	1020	0	873	1220	2711	1180	226	1827	944
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.6	29.7	28.4	33.9	0.0	33.0	27.5	9.2	6.6	33.7	18.1	18.2
Incr Delay (d2), s/veh	0.9	1.0	0.1	5.2	0.0	0.1	1.0	0.1	0.0	6.0	0.9	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	2.2	0.7	0.9	0.0	0.0	4.3	3.6	0.0	1.2	6.9	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.4	30.8	28.5	39.1	0.0	33.1	28.5	9.3	6.6	39.7	19.0	19.9
LnGrp LOS	C	C	C	D	A	C	C	A	A	D	B	B
Approach Vol, veh/h	369			56			1597			1662		
Approach Delay, s/veh	30.0			38.8			16.1			20.0		
Approach LOS	C			D			B			C		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	7.2	44.6	12.7		18.1	33.8	6.8					
Change Period (Y+Rc), s	4.0	5.3	4.9		4.0	* 5.3	4.0					
Max Green Setting (Gmax), s	9.0	52.7	21.1		25.0	* 37	39.0					
Max Q Clear Time (g_c+14.5), s	14.5	14.3	7.1		13.2	20.8	4.0					
Green Ext Time (p_c), s	0.0	4.8	0.7		0.9	7.5	0.1					

### Intersection Summary

HCM 6th Ctrl Delay 19.6  
HCM 6th LOS B

### Notes

User approved volume balancing among the lanes for turning movement.





\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	1269	454	117	902	40	312	61	91	50	31	80
Future Volume (veh/h)	110	1269	454	117	902	40	312	61	91	50	31	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	115	1322	406	122	940	17	325	64	23	52	32	14
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	148	1739	532	171	2391	43	427	369	310	66	136	59
Arrive On Green	0.08	0.45	0.44	0.10	0.46	0.46	0.12	0.20	0.20	0.04	0.11	0.09
Sat Flow, veh/h	1795	3893	1191	1795	5203	94	3483	1885	1585	1795	1239	542
Grp Volume(v), veh/h	115	1165	563	122	620	337	325	64	23	52	0	46
Grp Sat Flow(s),veh/h/ln	1795	1716	1653	1795	1716	1866	1742	1885	1585	1795	0	1781
Q Serve(g_s), s	4.5	20.2	20.3	4.7	8.5	8.5	6.4	2.0	0.8	2.0	0.0	1.7
Cycle Q Clear(g_c), s	4.5	20.2	20.3	4.7	8.5	8.5	6.4	2.0	0.8	2.0	0.0	1.7
Prop In Lane	1.00		0.72	1.00		0.05	1.00		1.00	1.00		0.30
Lane Grp Cap(c), veh/h	148	1533	739	171	1577	858	427	369	310	66	0	195
V/C Ratio(X)	0.78	0.76	0.76	0.71	0.39	0.39	0.76	0.17	0.07	0.79	0.00	0.24
Avail Cap(c_a), veh/h	430	2563	1235	430	2563	1394	687	1196	1005	228	0	1004
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.9	16.4	16.5	31.1	12.6	12.6	30.1	23.8	23.3	33.9	0.0	29.1
Incr Delay (d2), s/veh	3.3	0.3	0.6	2.1	0.1	0.1	1.1	0.1	0.0	7.7	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	6.5	6.4	2.0	2.7	2.9	2.5	0.8	0.3	1.0	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.2	16.7	17.2	33.2	12.7	12.8	31.2	23.8	23.3	41.6	0.0	29.3
LnGrp LOS	D	B	B	C	B	B	C	C	C	D	A	C
Approach Vol, veh/h	1843			1079			412			98		
Approach Delay, s/veh	18.0			15.0			29.6			35.8		
Approach LOS	B			B			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.6	17.9	10.8	35.7	12.7	11.8	9.9	36.6				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	4.0	43.7	17.0	* 53	14.0	38.7	17.0	* 53				
Max Q Clear Time (g_c+14), s	4.0	4.0	6.7	22.3	8.4	3.7	6.5	10.5				
Green Ext Time (p_c), s	0.0	0.2	0.1	9.2	0.3	0.1	0.1	3.9				

### Intersection Summary

HCM 6th Ctrl Delay 19.0

HCM 6th LOS B

### Notes





























\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Near Term Plus Project PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 		 	 	
Traffic Volume (veh/h)	70	881	362	310	720	230	262	369	263	350	356	30
Future Volume (veh/h)	70	881	362	310	720	230	262	369	263	350	356	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	73	918	127	323	750	103	273	384	170	365	371	27
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	95	1297	179	358	1977	269	349	547	239	442	858	62
Arrive On Green	0.05	0.28	0.27	0.20	0.43	0.41	0.10	0.23	0.21	0.13	0.25	0.24
Sat Flow, veh/h	1810	4590	632	1810	4616	629	3510	2432	1060	3510	3411	247
Grp Volume(v), veh/h	73	691	354	323	560	293	273	283	271	365	196	202
Grp Sat Flow(s),veh/h/ln	1810	1729	1764	1810	1729	1787	1755	1805	1687	1755	1805	1853
Q Serve(g_s), s	3.8	17.0	17.2	16.5	10.5	10.7	7.2	13.7	14.1	9.6	8.6	8.7
Cycle Q Clear(g_c), s	3.8	17.0	17.2	16.5	10.5	10.7	7.2	13.7	14.1	9.6	8.6	8.7
Prop In Lane	1.00		0.36	1.00		0.35	1.00		0.63	1.00		0.13
Lane Grp Cap(c), veh/h	95	977	498	358	1481	765	349	406	380	442	454	466
V/C Ratio(X)	0.77	0.71	0.71	0.90	0.38	0.38	0.78	0.70	0.71	0.83	0.43	0.43
Avail Cap(c_a), veh/h	210	1530	781	477	2040	1054	518	780	729	592	818	840
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	30.5	30.8	37.1	18.5	18.7	41.7	33.8	34.3	40.5	29.8	29.9
Incr Delay (d2), s/veh	4.9	0.4	0.7	14.1	0.1	0.1	2.4	0.8	0.9	5.4	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	6.7	7.0	8.3	3.9	4.1	3.1	5.8	5.6	4.3	3.6	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.4	30.9	31.5	51.3	18.6	18.8	44.1	34.6	35.3	45.8	30.1	30.2
LnGrp LOS	D	C	C	D	B	B	D	C	D	D	C	C
Approach Vol, veh/h		1118			1176			827			763	
Approach Delay, s/veh		32.3			27.6			38.0			37.6	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.9	25.4	22.8	30.8	13.4	27.9	9.0	44.7				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7				
Max Q Clear Time (g_c+I1), s	11.6	16.1	18.5	19.2	9.2	10.7	5.8	12.7				
Green Ext Time (p_c), s	0.3	1.9	0.3	4.2	0.2	1.3	0.0	3.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			33.1									
HCM 6th LOS			C									

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↑↑↑ ↱			↰ ↑↑↑ ↱			↰ ↑↑ ↱			↰ ↱ ↱ ↱ ↱		
Traffic Volume (veh/h)	236	971	160	153	1065	270	150	80	60	570	155	134
Future Volume (veh/h)	236	971	160	153	1065	270	150	80	60	570	155	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	246	1011	75	159	1109	82	156	83	6	594	161	37
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	286	1755	130	196	1589	486	117	423	30	691	925	404
Arrive On Green	0.16	0.36	0.34	0.11	0.31	0.31	0.07	0.12	0.11	0.20	0.26	0.26
Sat Flow, veh/h	1795	4888	362	1795	5147	1574	1795	3386	242	3483	3582	1566
Grp Volume(v), veh/h	246	709	377	159	1109	82	156	43	46	594	161	37
Grp Sat Flow(s),veh/h/ln	1795	1716	1819	1795	1716	1574	1795	1791	1838	1742	1791	1566
Q Serve(g_s), s	10.2	12.8	12.9	6.6	14.6	2.9	5.0	1.7	1.7	12.7	2.7	1.4
Cycle Q Clear(g_c), s	10.2	12.8	12.9	6.6	14.6	2.9	5.0	1.7	1.7	12.7	2.7	1.4
Prop In Lane	1.00		0.20	1.00		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	286	1232	653	196	1589	486	117	224	229	691	925	404
V/C Ratio(X)	0.86	0.58	0.58	0.81	0.70	0.17	1.33	0.19	0.20	0.86	0.17	0.09
Avail Cap(c_a), veh/h	327	2203	1168	257	3104	949	117	1043	1070	862	2739	1197
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.4	19.9	20.0	33.4	23.4	19.3	35.9	30.1	30.2	29.7	22.1	21.6
Incr Delay (d2), s/veh	16.5	0.2	0.3	10.4	0.2	0.1	197.2	0.2	0.2	6.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	4.6	4.9	3.3	5.3	1.0	8.5	0.7	0.7	5.4	1.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	20.0	20.3	43.8	23.6	19.4	233.1	30.3	30.4	35.9	22.2	21.7
LnGrp LOS	D	C	C	D	C	B	F	C	C	D	C	C
Approach Vol, veh/h	1332			1350			245			792		
Approach Delay, s/veh	25.3			25.7			159.5			32.5		
Approach LOS	C			C			F			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	13.6	12.4	31.6	9.0	23.8	16.2	27.7				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	43.4	11.0	48.0	5.0	57.4	14.0	45.0				
Max Q Clear Time (g_c+14), s	11.4	3.7	8.6	14.9	7.0	4.7	12.2	16.6				
Green Ext Time (p_c), s	0.6	0.3	0.0	4.6	0.0	0.7	0.1	5.3				

### Intersection Summary

HCM 6th Ctrl Delay	35.8
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1690	680	220	1831	0	0	0	0	750	0	780
Future Volume (veh/h)	0	1690	680	220	1831	0	0	0	0	750	0	780
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1779	330	232	1927	0				789	0	794
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1704	518	227	2445	0				1706	0	759
Arrive On Green	0.00	0.33	0.33	0.11	0.47	0.00				0.47	0.00	0.47
Sat Flow, veh/h	0	5358	1578	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	1779	330	232	1927	0				789	0	794
Grp Sat Flow(s),veh/h/ln	0	1729	1578	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	46.0	24.9	16.0	43.7	0.0				20.6	0.0	66.0
Cycle Q Clear(g_c), s	0.0	46.0	24.9	16.0	43.7	0.0				20.6	0.0	66.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1704	518	227	2445	0				1706	0	759
V/C Ratio(X)	0.00	1.04	0.64	1.02	0.79	0.00				0.46	0.00	1.05
Avail Cap(c_a), veh/h	0	1704	518	227	2445	0				1706	0	759
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	47.0	39.9	62.0	31.1	0.0				25.0	0.0	37.0
Incr Delay (d2), s/veh	0.0	34.2	2.0	64.9	1.6	0.0				0.1	0.0	45.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	24.5	9.7	6.0	17.7	0.0				8.6	0.0	34.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	81.2	41.9	126.9	32.8	0.0				25.1	0.0	82.3
LnGrp LOS	A	F	D	F	C	A				C	A	F
Approach Vol, veh/h		2109			2159						1583	
Approach Delay, s/veh		75.1			42.9						53.8	
Approach LOS		E			D						D	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	30.0	50.0		70.0		70.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	60.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I1), s	11.0	48.0		68.0		45.7						
Green Ext Time (p_c), s	0.0	0.0		0.0		9.4						

### Intersection Summary

HCM 6th Ctrl Delay 57.4  
HCM 6th LOS E

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1910	530	170	1261	580	790	40	400	0	0	0
Future Volume (veh/h)	0	1910	530	170	1261	580	790	40	400	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	0	2011	361	179	1327	374	862	0	274			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	1	1	1	1	1	1	1	1			
Cap, veh/h	0	2407	735	212	3237	977	1023	0	455			
Arrive On Green	0.00	0.47	0.47	0.12	0.63	0.63	0.28	0.00	0.28			
Sat Flow, veh/h	0	5316	1572	1795	5147	1554	3591	0	1598			
Grp Volume(v), veh/h	0	2011	361	179	1327	374	862	0	274			
Grp Sat Flow(s),veh/h/ln	0	1716	1572	1795	1716	1554	1795	0	1598			
Q Serve(g_s), s	0.0	31.7	14.7	9.1	12.0	10.9	20.9	0.0	13.7			
Cycle Q Clear(g_c), s	0.0	31.7	14.7	9.1	12.0	10.9	20.9	0.0	13.7			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2407	735	212	3237	977	1023	0	455			
V/C Ratio(X)	0.00	0.84	0.49	0.84	0.41	0.38	0.84	0.00	0.60			
Avail Cap(c_a), veh/h	0	2664	814	213	3497	1056	1897	0	844			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	21.6	17.0	40.1	8.6	8.4	31.2	0.0	28.6			
Incr Delay (d2), s/veh	0.0	2.0	0.2	24.2	0.0	0.1	0.8	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	11.6	4.8	5.2	3.6	3.0	8.5	0.0	5.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.6	17.2	64.3	8.6	8.5	32.0	0.0	29.1			
LnGrp LOS	A	C	B	E	A	A	C	A	C			
Approach Vol, veh/h		2372			1880			1136				
Approach Delay, s/veh		22.6			13.9			31.3				
Approach LOS		C			B			C				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	4.9	47.4		30.4		62.3						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	46.7			47.7		61.7						
Max Q Clear Time (g_c+I1), s	33.7			22.9		14.0						
Green Ext Time (p_c), s	0.0	8.4		2.2		8.0						

## Intersection Summary

HCM 6th Ctrl Delay	21.4
HCM 6th LOS	C

## Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	50	5	24	50	165	21	174	18	200	313	40
Future Volume (veh/h)	40	50	5	24	50	165	21	174	18	200	313	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	43	54	3	26	54	81	23	187	11	215	337	34
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	199	189	11	199	73	109	199	562	33	313	745	75
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.16	0.13	0.17	0.23	0.19
Sat Flow, veh/h	1795	1769	98	1795	681	1021	1795	3439	201	1795	3286	329
Grp Volume(v), veh/h	43	0	57	26	0	135	23	97	101	215	183	188
Grp Sat Flow(s),veh/h/ln	1795	0	1867	1795	0	1701	1795	1791	1849	1795	1791	1824
Q Serve(g_s), s	0.8	0.0	1.0	0.5	0.0	2.8	0.4	1.7	1.8	4.0	3.2	3.2
Cycle Q Clear(g_c), s	0.8	0.0	1.0	0.5	0.0	2.8	0.4	1.7	1.8	4.0	3.2	3.2
Prop In Lane	1.00		0.05	1.00		0.60	1.00		0.11	1.00		0.18
Lane Grp Cap(c), veh/h	199	0	200	199	0	182	199	293	302	313	406	413
V/C Ratio(X)	0.22	0.00	0.29	0.13	0.00	0.74	0.12	0.33	0.33	0.69	0.45	0.46
Avail Cap(c_a), veh/h	548	0	1865	548	0	1700	1047	2535	2618	1047	2535	2582
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.6	0.0	14.8	14.4	0.0	15.6	14.4	13.3	13.4	14.0	12.0	12.1
Incr Delay (d2), s/veh	0.2	0.0	0.3	0.1	0.0	2.2	0.1	0.2	0.2	1.0	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.3	0.1	0.0	0.9	0.1	0.5	0.5	1.2	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.8	0.0	15.1	14.6	0.0	17.8	14.5	13.6	13.6	15.0	12.3	12.4
LnGrp LOS	B	A	B	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	100			161			221			586		
Approach Delay, s/veh	15.0			17.3			13.7			13.3		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	8.0	7.9	8.0	12.2	8.0	7.9					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	11.0	36.0	21.0	49.7	11.0	36.0					
Max Q Clear Time (g_c+16, s)	3.8	2.5	3.0	2.4	5.2	2.8	4.8					
Green Ext Time (p_c), s	0.2	0.6	0.0	0.1	0.0	1.2	0.0	0.4				

## Intersection Summary

HCM 6th Ctrl Delay 14.1









HCM 6th LOS B

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	110	75	149	90	90	145	642	213	290	639	90
Future Volume (veh/h)	70	110	75	149	90	90	145	642	213	290	639	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	75	118	55	160	97	62	156	690	200	312	687	88
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	97	154	72	201	198	127	198	895	259	360	1332	170
Arrive On Green	0.05	0.13	0.13	0.11	0.18	0.18	0.11	0.32	0.30	0.20	0.41	0.39
Sat Flow, veh/h	1810	1226	571	1810	1083	692	1810	2761	800	1810	3219	412
Grp Volume(v), veh/h	75	0	173	160	0	159	156	451	439	312	385	390
Grp Sat Flow(s),veh/h/ln	1810	0	1797	1810	0	1775	1810	1805	1756	1810	1805	1826
Q Serve(g_s), s	2.7	0.0	6.2	5.8	0.0	5.4	5.6	15.0	15.1	11.1	10.6	10.7
Cycle Q Clear(g_c), s	2.7	0.0	6.2	5.8	0.0	5.4	5.6	15.0	15.1	11.1	10.6	10.7
Prop In Lane	1.00		0.32	1.00		0.39	1.00		0.46	1.00		0.23
Lane Grp Cap(c), veh/h	97	0	226	201	0	325	198	585	569	360	747	755
V/C Ratio(X)	0.77	0.00	0.76	0.80	0.00	0.49	0.79	0.77	0.77	0.87	0.52	0.52
Avail Cap(c_a), veh/h	298	0	997	271	0	958	516	1083	1053	461	1029	1040
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	0.0	28.2	28.9	0.0	24.4	28.9	20.3	20.6	25.8	14.6	14.7
Incr Delay (d2), s/veh	4.9	0.0	2.0	8.0	0.0	0.4	2.6	0.8	0.8	11.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	2.5	2.7	0.0	2.1	2.3	5.5	5.5	5.4	3.6	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.0	0.0	30.2	36.9	0.0	24.9	31.5	21.1	21.4	36.9	14.8	14.9
LnGrp LOS	D	A	C	D	A	C	C	C	C	D	B	B
Approach Vol, veh/h	248		319			1046			1087			
Approach Delay, s/veh	32.0		30.9			22.8			21.2			
Approach LOS	C		C			C			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.3	25.6	11.4	12.4	11.3	31.6	7.6	16.2				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	7.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0				
Max Q Clear Time (g_c+I1), s	11.3	17.1	7.8	8.2	7.6	12.7	4.7	7.4				
Green Ext Time (p_c), s	0.2	3.2	0.0	0.5	0.1	2.7	0.0	0.5				

### Intersection Summary











HCM 6th Ctrl Delay	23.9
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	0	28	70	0	260	9	697	44	70	587	195
Future Volume (veh/h)	124	0	28	70	0	260	9	697	44	70	587	195
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	1870	1870	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	135	0	2	81	0	144	10	810	13	81	683	187
Peak Hour Factor	0.92	0.92	0.92	0.86	0.92	0.86	0.92	0.86	0.86	0.86	0.86	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	0	0	0	0	0
Cap, veh/h	191	0	287	104	0	191	43	1243	542	103	1055	289
Arrive On Green	0.11	0.00	0.17	0.06	0.00	0.12	0.02	0.34	0.34	0.06	0.38	0.35
Sat Flow, veh/h	1781	0	1585	1810	0	1585	1781	3610	1574	1810	2801	766
Grp Volume(v), veh/h	135	0	2	81	0	144	10	810	13	81	440	430
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1810	0	1585	1781	1805	1574	1810	1805	1762
Q Serve(g_s), s	3.3	0.0	0.0	2.0	0.0	3.9	0.2	8.4	0.2	2.0	8.9	9.0
Cycle Q Clear(g_c), s	3.3	0.0	0.0	2.0	0.0	3.9	0.2	8.4	0.2	2.0	8.9	9.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	191	0	287	104	0	191	43	1243	542	103	680	664
V/C Ratio(X)	0.71	0.00	0.01	0.78	0.00	0.75	0.23	0.65	0.02	0.79	0.65	0.65
Avail Cap(c_a), veh/h	220	0	660	1385	0	1677	220	3290	1435	448	1869	1824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	0.0	15.1	20.7	0.0	18.9	21.3	12.3	9.6	20.7	11.4	11.7
Incr Delay (d2), s/veh	8.4	0.0	0.0	4.6	0.0	2.3	2.7	0.2	0.0	4.9	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0	0.8	0.0	1.3	0.1	2.4	0.1	0.8	2.5	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.6	0.0	15.1	25.3	0.0	21.2	23.9	12.5	9.6	25.6	11.8	12.1
LnGrp LOS	C	A	B	C	A	C	C	B	A	C	B	B
Approach Vol, veh/h	137				225				833		951	
Approach Delay, s/veh	27.4				22.7				12.6		13.1	
Approach LOS	C				C				B		B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	19.3	6.6	12.1	5.1	20.7	8.8	9.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.5	4.5	5.3	4.5	* 4.5				
Max Green Setting (Gmax), s	1.0	39.2	34.0	18.0	5.0	44.7	5.0	* 47				
Max Q Clear Time (g_c+14), s	14.0	10.4	4.0	2.0	2.2	11.0	5.3	5.9				
Green Ext Time (p_c), s	0.0	3.5	0.1	0.0	0.0	3.3	0.0	0.5				

### Intersection Summary

HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Near Term Plus Project PM Peak Hour

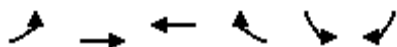


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	0	40	110	0	120	100	289	90	100	318	107
Future Volume (veh/h)	111	0	40	110	0	120	100	289	90	100	318	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	126	0	8	125	0	24	114	328	69	114	361	91
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	356	255	216	476	0	216	158	909	189	158	875	218
Arrive On Green	0.13	0.00	0.13	0.13	0.00	0.13	0.09	0.31	0.25	0.09	0.31	0.25
Sat Flow, veh/h	1409	1900	1610	1430	0	1610	1810	2976	618	1810	2864	713
Grp Volume(v), veh/h	126	0	8	125	0	24	114	197	200	114	226	226
Grp Sat Flow(s), veh/h/ln	1409	1900	1610	1430	0	1610	1810	1805	1789	1810	1805	1772
Q Serve(g_s), s	1.3	0.0	0.1	2.1	0.0	0.3	1.6	2.2	2.3	1.6	2.5	2.6
Cycle Q Clear(g_c), s	3.4	0.0	0.1	2.1	0.0	0.3	1.6	2.2	2.3	1.6	2.5	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.35	1.00		0.40
Lane Grp Cap(c), veh/h	356	255	216	476	0	216	158	552	547	158	552	541
V/C Ratio(X)	0.35	0.00	0.04	0.26	0.00	0.11	0.72	0.36	0.37	0.72	0.41	0.42
Avail Cap(c_a), veh/h	2612	3297	2794	2764	0	2794	1998	3488	3456	1070	2562	2515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.3	0.0	9.6	10.4	0.0	9.6	11.3	6.9	7.1	11.3	7.0	7.2
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	0.0	0.1	2.4	0.1	0.2	2.4	0.2	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.5	0.0	0.0	0.4	0.0	0.1	0.4	0.3	0.3	0.5	0.5	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	12.5	0.0	9.6	10.5	0.0	9.7	13.6	7.0	7.2	13.6	7.2	7.4
LnGrp LOS	B	A	A	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h	134			149			511			566		
Approach Delay, s/veh	12.4			10.4			8.6			8.6		
Approach LOS	B			B			A			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	11.7		7.4	6.2	11.7		7.4				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	47.7	47.7		44.0	28.0	34.7		44.0				
Max Q Clear Time (g_c+1), s	4.3	4.3		5.4	3.6	4.6		4.1				
Green Ext Time (p_c), s	0.1	1.3		0.2	0.1	1.8		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	9.1											
HCM 6th LOS	A											

# HCM 6th Signalized Intersection Summary

## 18: Sand Creek Road & Hillcrest Avenue

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	100	120	191	263	10
Future Volume (veh/h)	10	100	120	191	263	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	109	130	11	286	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	710	868	811	68	466	415
Arrive On Green	0.24	0.24	0.24	0.21	0.26	0.26
Sat Flow, veh/h	1248	3647	3413	278	1781	1585
Grp Volume(v), veh/h	11	109	69	72	286	7
Grp Sat Flow(s),veh/h/ln	1248	1777	1777	1820	1781	1585
Q Serve(g_s), s	0.1	0.4	0.5	0.5	2.3	0.1
Cycle Q Clear(g_c), s	0.6	0.4	0.5	0.5	2.3	0.1
Prop In Lane	1.00			0.15	1.00	1.00
Lane Grp Cap(c), veh/h	710	868	434	445	466	415
V/C Ratio(X)	0.02	0.13	0.16	0.16	0.61	0.02
Avail Cap(c_a), veh/h	3487	8778	3566	3653	3520	3132
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.1	4.8	4.8	4.8	5.3	4.4
Incr Delay (d2), s/veh	0.0	0.1	0.2	0.2	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.1	4.8	5.0	5.0	6.6	4.4
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		120	141		293	
Approach Delay, s/veh		4.9	5.0		6.5	
Approach LOS		A	A		A	
Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			8.0		8.2	8.0
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			39.5		31.5	32.0
Max Q Clear Time (g_c+I1), s			2.6		4.3	2.5
Green Ext Time (p_c), s			0.6		0.8	0.7
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			5.8			
HCM 6th LOS			A			

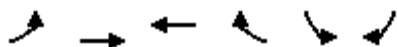
### Notes






User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

The Ranch  
Near Term Plus Project PM Peak Hour

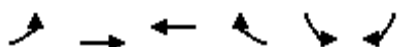


Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	10	343	301	120	140	10	
Future Volume (veh/h)	10	343	301	120	140	10	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	11	373	327	87	152	7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	38	934	508	133	1102	980	
Arrive On Green	0.02	0.26	0.18	0.17	0.62	0.62	
Sat Flow, veh/h	1781	3647	2879	730	1781	1585	
Grp Volume(v), veh/h	11	373	207	207	152	7	
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1739	1781	1585	
Q Serve(g_s), s	0.4	5.8	7.3	7.5	2.4	0.1	
Cycle Q Clear(g_c), s	0.4	5.8	7.3	7.5	2.4	0.1	
Prop In Lane	1.00			0.42	1.00	1.00	
Lane Grp Cap(c), veh/h	38	934	324	317	1102	980	
V/C Ratio(X)	0.29	0.40	0.64	0.65	0.14	0.01	
Avail Cap(c_a), veh/h	830	4206	1170	1145	1102	980	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	32.5	20.5	25.5	25.7	5.4	4.9	
Incr Delay (d2), s/veh	4.2	0.3	2.1	2.3	0.3	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.2	2.2	2.9	3.0	0.7	0.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	36.7	20.7	27.6	28.0	5.6	4.9	
LnGrp LOS	D	C	C	C	A	A	
Approach Vol, veh/h							
		384	414		159		
Approach Delay, s/veh							
		21.2	27.8		5.6		
Approach LOS							
		C	C		A		
Timer - Assigned Phs							
				4	6	7	8
Phs Duration (G+Y+Rc), s				21.7	45.7	5.4	16.3
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				79.3	41.2	30.9	43.9
Max Q Clear Time (g_c+I1), s				7.8	4.4	2.4	9.5
Green Ext Time (p_c), s				2.4	0.4	0.0	2.3
Intersection Summary							
HCM 6th Ctrl Delay			21.5				
HCM 6th LOS			C				

# HCM 6th Signalized Intersection Summary

## 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Near Term Plus Project PM Peak Hour










Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	200	343	468	190	1420	94
Future Volume (veh/h)	200	343	468	190	1420	94
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	217	373	509	60	1543	100
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	188	553	553	469	1859	853
Arrive On Green	0.29	0.29	0.29	0.29	0.53	0.53
Sat Flow, veh/h	856	1900	1900	1610	3510	1610
Grp Volume(v), veh/h	217	373	509	60	1543	100
Grp Sat Flow(s),veh/h/ln	856	1900	1900	1610	1755	1610
Q Serve(g_s), s	1.4	7.7	11.6	1.2	16.5	1.4
Cycle Q Clear(g_c), s	13.0	7.7	11.6	1.2	16.5	1.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	188	553	553	469	1859	853
V/C Ratio(X)	1.15	0.67	0.92	0.13	0.83	0.12
Avail Cap(c_a), veh/h	188	553	553	469	6211	2849
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.2	14.0	15.3	11.7	8.8	5.3
Incr Delay (d2), s/veh	112.3	2.7	20.4	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	2.8	6.8	0.3	3.2	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	134.5	16.6	35.7	11.7	9.2	5.3
LnGrp LOS	F	B	D	B	A	A
Approach Vol, veh/h		590	569		1643	
Approach Delay, s/veh		60.0	33.2		9.0	
Approach LOS		E	C		A	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		17.0			17.0	27.7
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		11.7			11.7	77.7
Max Q Clear Time (g_c+I1), s		15.0			13.6	18.5
Green Ext Time (p_c), s		0.0			0.0	3.9
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			24.6			
HCM 6th LOS			C			
<b>Notes</b>						
User approved pedestrian interval to be less than phase max green.						

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	1613	0	0	353	990	305	10	260	0	0	0
Future Volume (veh/h)	160	1613	0	0	353	990	305	10	260	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	168	1698	0	0	372	607	329	0	233			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	301	2914	0	0	713	1208	855	0	380			
Arrive On Green	0.09	0.56	0.00	0.00	0.38	0.38	0.24	0.00	0.24			
Sat Flow, veh/h	3510	5358	0	0	1900	3220	3619	0	1610			
Grp Volume(v), veh/h	168	1698	0	0	372	607	329	0	233			
Grp Sat Flow(s),veh/h/ln	1755	1729	0	0	1900	1610	1810	0	1610			
Q Serve(g_s), s	1.8	8.4	0.0	0.0	6.0	5.7	3.0	0.0	5.1			
Cycle Q Clear(g_c), s	1.8	8.4	0.0	0.0	6.0	5.7	3.0	0.0	5.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	301	2914	0	0	713	1208	855	0	380			
V/C Ratio(X)	0.56	0.58	0.00	0.00	0.52	0.50	0.38	0.00	0.61			
Avail Cap(c_a), veh/h	1418	9824	0	0	2639	4473	4295	0	1911			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	17.4	5.7	0.0	0.0	9.6	9.5	12.7	0.0	13.5			
Incr Delay (d2), s/veh	0.6	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.6	1.1	0.0	0.0	1.6	1.3	0.9	0.0	4.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.0	5.7	0.0	0.0	9.8	9.6	12.8	0.0	14.1			
LnGrp LOS	B	A	A	A	A	A	B	A	B			
Approach Vol, veh/h	1866			979			562					
Approach Delay, s/veh	6.8			9.7			13.3					
Approach LOS	A			A			B					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	26.2			13.4		7.4	18.9					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	73.7			45.7		16.0	53.7					
Max Q Clear Time (g_c+I1), s	10.4			7.1		3.8	8.0					
Green Ext Time (p_c), s	10.5			1.0		0.2	2.7					

### Intersection Summary




HCM 6th Ctrl Delay	8.7
HCM 6th LOS	A

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

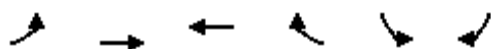
The Ranch  
Near Term Plus Project PM Peak Hour

Intersection						
Int Delay, s/veh	19.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	486	113	50	398	89
Future Vol, veh/h	40	486	113	50	398	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	44	534	124	55	437	98
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1124	152	0	0	179	0
Stage 1	152	-	-	-	-	-
Stage 2	972	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	229	900	-	-	1409	-
Stage 1	881	-	-	-	-	-
Stage 2	370	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	154	900	-	-	1409	-
Mov Cap-2 Maneuver	154	-	-	-	-	-
Stage 1	881	-	-	-	-	-
Stage 2	249	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	37.1	0		7.1		
HCM LOS	E					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	658	1409	-	
HCM Lane V/C Ratio	-	-	0.878	0.31	-	
HCM Control Delay (s)	-	-	37.1	8.7	0	
HCM Lane LOS	-	-	E	A	A	
HCM 95th %tile Q(veh)	-	-	10.6	1.3	-	

# HCM 6th Signalized Intersection Summary

## 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Near Term Plus Project PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↱↱	↱	↰	↱↱	
Traffic Volume (veh/h)	114	1309	885	30	630	610	
Future Volume (veh/h)	114	1309	885	30	630	610	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	121	1393	941	0	670	625	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	192	1536	1215		887	1545	
Arrive On Green	0.06	0.43	0.34	0.00	0.50	0.50	
Sat Flow, veh/h	3456	3647	3647	1585	1781	2790	
Grp Volume(v), veh/h	121	1393	941	0	670	625	
Grp Sat Flow(s),veh/h/ln	1728	1777	1777	1585	1781	1395	
Q Serve(g_s), s	3.9	42.1	27.3	0.0	34.8	14.8	
Cycle Q Clear(g_c), s	3.9	42.1	27.3	0.0	34.8	14.8	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	192	1536	1215		887	1545	
V/C Ratio(X)	0.63	0.91	0.77		0.76	0.40	
Avail Cap(c_a), veh/h	361	1740	1245		887	1545	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	53.1	30.5	33.9	0.0	23.2	14.8	
Incr Delay (d2), s/veh	1.3	6.3	2.7	0.0	3.3	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.7	18.0	11.6	0.0	14.9	14.4	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	54.4	36.8	36.6	0.0	26.5	14.8	
LnGrp LOS	D	D	D		C	B	
Approach Vol, veh/h							
		1514	941	A	1295		
Approach Delay, s/veh							
		38.2	36.6		20.9		
Approach LOS							
		D	D		C		
Timer - Assigned Phs							
				4	6	7	8
Phs Duration (G+Y+Rc), s				53.7	61.3	10.4	43.3
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				55.8	50.2	11.5	39.8
Max Q Clear Time (g_c+I1), s				44.1	36.8	5.9	29.3
Green Ext Time (p_c), s				5.1	2.5	0.1	3.1
Intersection Summary							
HCM 6th Ctrl Delay			31.8				
HCM 6th LOS			C				

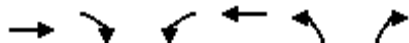
### Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Near Term Plus Project PM Peak Hour














Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	1389	580	0	1243	212	70
Future Volume (veh/h)	1389	580	0	1243	212	70
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1510	402	0	1351	230	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1912	853	0	1912	1356	622
Arrive On Green	0.54	0.54	0.00	0.54	0.39	0.39
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1510	402	0	1351	230	23
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	39.2	18.0	0.0	32.6	5.0	1.0
Cycle Q Clear(g_c), s	39.2	18.0	0.0	32.6	5.0	1.0
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1913	853	0	1913	1356	622
V/C Ratio(X)	0.79	0.47	0.00	0.71	0.17	0.04
Avail Cap(c_a), veh/h	2565	1144	0	2565	1356	622
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	16.4	0.0	19.8	22.8	21.6
Incr Delay (d2), s/veh	1.2	0.4	0.0	0.6	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	6.5	0.0	12.4	2.1	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.6	16.8	0.0	20.4	23.0	21.7
LnGrp LOS	C	B	A	C	C	C
Approach Vol, veh/h	1912			1351	253	
Approach Delay, s/veh	21.4			20.4	22.9	
Approach LOS	C			C	C	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	49.1			65.9		65.9
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	23.5			82.5		82.5
Max Q Clear Time (g_c+I1), s	7.0			41.2		34.6
Green Ext Time (p_c), s	0.8			20.1		12.8
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			21.1			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Near Term Plus Project PM Peak Hour





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	30	243	0	20	0	67	160	0	10	260	168
Future Volume (veh/h)	190	30	243	0	20	0	67	160	0	10	260	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	202	32	259	0	21	0	71	170	0	11	277	179
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	257	728	617	5	261	0	147	951	424	49	756	337
Arrive On Green	0.14	0.39	0.39	0.00	0.14	0.00	0.08	0.27	0.00	0.03	0.21	0.21
Sat Flow, veh/h	1781	1870	1585	1781	1870	0	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	202	32	259	0	21	0	71	170	0	11	277	179
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	0	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.2	0.4	4.5	0.0	0.4	0.0	1.4	1.4	0.0	0.2	2.5	3.8
Cycle Q Clear(g_c), s	4.2	0.4	4.5	0.0	0.4	0.0	1.4	1.4	0.0	0.2	2.5	3.8
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	257	728	617	5	261	0	147	951	424	49	756	337
V/C Ratio(X)	0.78	0.04	0.42	0.00	0.08	0.00	0.48	0.18	0.00	0.22	0.37	0.53
Avail Cap(c_a), veh/h	257	909	771	257	909	0	257	1821	812	257	1821	812
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.7	7.2	8.5	0.0	14.2	0.0	16.7	10.7	0.0	18.1	12.8	13.3
Incr Delay (d2), s/veh	14.6	0.0	0.5	0.0	0.1	0.0	2.4	0.1	0.0	2.3	0.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.1	1.2	0.0	0.1	0.0	0.6	0.4	0.0	0.1	0.7	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.4	7.2	8.9	0.0	14.4	0.0	19.1	10.8	0.0	20.4	13.1	14.6
LnGrp LOS	C	A	A	A	B	A	B	B	A	C	B	B
Approach Vol, veh/h	493		21			241			467			
Approach Delay, s/veh	17.6		14.4			13.3			13.8			
Approach LOS	B		B			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.0	14.2	0.0	18.8	7.1	12.1	9.5	9.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+I12, s)	12.2	3.4	0.0	6.5	3.4	5.8	6.2	2.4				
Green Ext Time (p_c), s	0.0	0.7	0.0	0.8	0.0	1.8	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			15.2									
HCM 6th LOS			B									

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Near Term Plus Project AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	20	875	0	0	0	0	1494	394	170	705	0
Future Volume (veh/h)	180	20	875	0	0	0	0	1494	394	170	705	0
Initial Q (Qb), veh	0	0	60				0	60	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1826	1826	0
Adj Flow Rate, veh/h	205	23	403				0	1698	407	193	801	0
Peak Hour Factor	0.88	0.88	0.88				0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	619	0	688				0	2378	441	238	3375	0
Arrive On Green	0.16	0.15	0.16				0.00	0.53	0.52	0.08	0.68	0.00
Sat Flow, veh/h	3456	0	3614				0	4815	974	3374	5149	0
Grp Volume(v), veh/h	205	0	403				0	1405	700	193	801	0
Grp Sat Flow(s),veh/h/ln	1728	0	1205				0	1122	1675	1687	1662	0
Q Serve(g_s), s	3.1	0.0	6.2				0.0	19.8	19.9	3.3	3.6	0.0
Cycle Q Clear(g_c), s	3.1	0.0	6.2				0.0	19.8	19.9	3.3	3.6	0.0
Prop In Lane	1.00		1.00				0.00		0.58	1.00		0.00
Lane Grp Cap(c), veh/h	619	0	688				0	1809	911	238	3375	0
V/C Ratio(X)	0.33	0.00	0.59				0.00	0.78	0.77	0.81	0.24	0.00
Avail Cap(c_a), veh/h	832	0	871				0	2205	1097	258	3941	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.0	0.0	27.1				0.0	13.2	12.3	29.6	4.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.3				0.0	1.1	2.1	15.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	132.2				0.0	20.0	8.4	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	11.6				0.0	8.5	9.1	1.8	0.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	0.0	159.6				0.0	34.3	22.8	44.6	4.0	0.0
LnGrp LOS	C	A	F				A	C	C	D	A	A
Approach Vol, veh/h	608						2105			994		
Approach Delay, s/veh	113.6						30.5			11.9		
Approach LOS	F						C			B		
Timer - Assigned Phs	1	2		4			6					
Phs Duration (G+Y+Rc), s	8.9	35.8		14.3			44.7					
Change Period (Y+Rc), s	4.9	* 4.9		5.3			4.9					
Max Green Setting (Gmax), s	4.0	* 38		13.7			46.1					
Max Q Clear Time (g_c+I1), s	5.3	21.9		8.2			5.6					
Green Ext Time (p_c), s	0.0	9.0		0.8			3.6					

### Intersection Summary

HCM 6th Ctrl Delay 39.1

HCM 6th LOS D

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 22: Deer Valley Road & Balfour Road

The Ranch  
Near Term Plus Project AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	80	391	44	30	461	110
Future Volume (veh/h)	80	391	44	30	461	110
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	85	83	47	15	490	117
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	115	112	727	232	838	144
Arrive On Green	0.13	0.13	0.53	0.53	0.53	0.53
Sat Flow, veh/h	858	838	1380	440	1126	273
Grp Volume(v), veh/h	169	0	0	62	607	0
Grp Sat Flow(s),veh/h/ln	1706	0	0	1821	1399	0
Q Serve(g_s), s	2.5	0.0	0.0	0.4	9.4	0.0
Cycle Q Clear(g_c), s	2.5	0.0	0.0	0.4	9.8	0.0
Prop In Lane	0.50	0.49		0.24	0.81	
Lane Grp Cap(c), veh/h	229	0	0	959	982	0
V/C Ratio(X)	0.74	0.00	0.00	0.06	0.62	0.00
Avail Cap(c_a), veh/h	1157	0	0	1234	1200	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.0	0.0	0.0	3.1	5.5	0.0
Incr Delay (d2), s/veh	4.6	0.0	0.0	0.0	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.0	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.7	0.0	0.0	3.1	6.1	0.0
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	169		62		607	
Approach Delay, s/veh	15.7		3.1		6.1	
Approach LOS	B		A		A	
Timer - Assigned Phs	2		6		8	
Phs Duration (G+Y+Rc), s	18.5		18.5		8.1	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	18.0		18.0		18.0	
Max Q Clear Time (g_c+I1), s	2.4		11.8		4.5	
Green Ext Time (p_c), s	0.2		2.1		0.4	

### Intersection Summary

HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A


















### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Near Term Plus Project PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	320	0	1516	0	0	0	0	1250	466	350	884	0
Future Volume (veh/h)	320	0	1516	0	0	0	0	1250	466	350	884	0
Initial Q (Qb), veh	0	0	20				0	20	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	0	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	327	0	1136				0	1276	423	357	902	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	0	1				0	1	1	1	1	0
Cap, veh/h	1253	0	1309				0	1631	457	345	2864	0
Arrive On Green	0.35	0.00	0.35				0.00	0.40	0.39	0.11	0.56	0.00
Sat Flow, veh/h	3483	0	3643				0	4546	1255	3483	5316	0
Grp Volume(v), veh/h	327	0	1136				0	1142	557	357	902	0
Grp Sat Flow(s),veh/h/ln	1742	0	1214				0	1131	1654	1742	1716	0
Q Serve(g_s), s	6.2	0.0	26.9				0.0	28.1	28.3	9.4	8.6	0.0
Cycle Q Clear(g_c), s	6.2	0.0	26.9				0.0	28.1	28.3	9.4	8.6	0.0
Prop In Lane	1.00		1.00				0.00		0.76	1.00		0.00
Lane Grp Cap(c), veh/h	1253	0	1309				0	1354	665	345	2864	0
V/C Ratio(X)	0.26	0.00	0.87				0.00	0.84	0.84	1.03	0.31	0.00
Avail Cap(c_a), veh/h	1401	0	1465				0	1513	737	379	3078	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.7	0.0	29.5				0.0	26.4	26.1	45.5	11.4	0.0
Incr Delay (d2), s/veh	0.0	0.0	4.9				0.0	3.7	7.0	54.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	12.7				0.0	5.6	2.5	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	10.4				0.0	8.8	12.5	6.8	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.7	0.0	47.1				0.0	35.8	35.6	100.4	11.5	0.0
LnGrp LOS	C	A	D				A	D	D	F	B	A
Approach Vol, veh/h	1463						1699			1259		
Approach Delay, s/veh	41.4						35.7			36.7		
Approach LOS	D						D			D		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	14.9	40.5	36.6		55.4							
Change Period (Y+Rc), s	4.9	* 4.9	5.3		4.9							
Max Green Setting (Gmax), s	10.0	* 40	35.7		54.1							
Max Q Clear Time (g_c+I1), s	11.4	30.3	28.9		10.6							
Green Ext Time (p_c), s	0.0	5.3	2.4		4.1							

### Intersection Summary

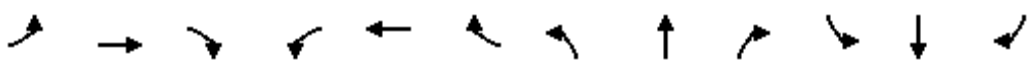
HCM 6th Ctrl Delay	37.9
HCM 6th LOS	D

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.










# HCM 6th Signalized Intersection Summary 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Near Term Plus Project PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↘↘	↑↑↑					↗	↖	↗
Traffic Volume (veh/h)	0	1690	680	220	1831	0	0	0	0	750	0	780
Future Volume (veh/h)	0	1690	680	220	1831	0	0	0	0	750	0	780
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1779	330	232	1927	0				789	0	794
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1815	553	213	2519	0				1654	0	736
Arrive On Green	0.00	0.35	0.35	0.11	0.49	0.00				0.46	0.00	0.46
Sat Flow, veh/h	0	5358	1579	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	1779	330	232	1927	0				789	0	794
Grp Sat Flow(s),veh/h/ln	0	1729	1579	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	47.5	24.0	15.0	42.6	0.0				21.2	0.0	64.0
Cycle Q Clear(g_c), s	0.0	47.5	24.0	15.0	42.6	0.0				21.2	0.0	64.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1815	553	213	2519	0				1654	0	736
V/C Ratio(X)	0.00	0.98	0.60	1.09	0.76	0.00				0.48	0.00	1.08
Avail Cap(c_a), veh/h	0	1815	553	213	2519	0				1654	0	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	45.0	37.4	62.5	29.5	0.0				26.4	0.0	38.0
Incr Delay (d2), s/veh	0.0	16.5	1.2	87.0	1.3	0.0				0.1	0.0	56.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	22.4	9.2	6.3	17.1	0.0				8.9	0.0	35.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	61.5	38.6	149.5	30.8	0.0				26.5	0.0	94.4
LnGrp LOS	A	E	D	F	C	A				C	A	F
Approach Vol, veh/h		2109			2159						1583	
Approach Delay, s/veh		57.9			43.5						60.6	
Approach LOS		E			D						E	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	19.0	53.0		68.0		72.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	15.0	47.7		62.7		66.7						
Max Q Clear Time (g_c+I1), s	17.0	49.5		66.0		44.6						
Green Ext Time (p_c), s	0.0	0.0		0.0		10.2						
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			53.3									
HCM 6th LOS			D									
<b>Notes</b>												
User approved volume balancing among the lanes for turning movement.												

# HCM 6th Signalized Intersection Summary 22: Deer Valley Road & Balfour Road

The Ranch  
Near Term Plus Project PM Peak Hour



















						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	40	486	113	50	398	89
Future Volume (veh/h)	40	486	113	50	398	89
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	44	90	124	25	437	98
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	66	135	801	161	785	141
Arrive On Green	0.12	0.12	0.52	0.52	0.52	0.52
Sat Flow, veh/h	545	1115	1535	309	1007	271
Grp Volume(v), veh/h	135	0	0	149	535	0
Grp Sat Flow(s),veh/h/ln	1672	0	0	1844	1278	0
Q Serve(g_s), s	1.9	0.0	0.0	1.1	8.0	0.0
Cycle Q Clear(g_c), s	1.9	0.0	0.0	1.1	9.0	0.0
Prop In Lane	0.33	0.67		0.17	0.82	
Lane Grp Cap(c), veh/h	203	0	0	962	926	0
V/C Ratio(X)	0.67	0.00	0.00	0.15	0.58	0.00
Avail Cap(c_a), veh/h	1194	0	0	1317	1185	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.6	0.0	0.0	3.1	5.3	0.0
Incr Delay (d2), s/veh	3.7	0.0	0.0	0.1	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.1	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.3	0.0	0.0	3.2	5.8	0.0
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	135		149		535	
Approach Delay, s/veh	14.3		3.2		5.8	
Approach LOS	B		A		A	
Timer - Assigned Phs	2		6		8	
Phs Duration (G+Y+Rc), s	17.6		17.6		7.6	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	18.0		18.0		18.0	
Max Q Clear Time (g_c+I1), s	3.1		11.0		3.9	
Green Ext Time (p_c), s	0.6		2.1		0.3	
Intersection Summary						
HCM 6th Ctrl Delay			6.8			
HCM 6th LOS			A			



# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Cumulative AM Peak Hour







												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	370	10	450	1030	930	0	0	790	530
Future Volume (veh/h)	0	0	0	370	10	450	1030	930	0	0	790	530
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	1885	1885	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				402	11	390	1120	1011	0	0	859	230
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				1	1	1	2	2	0	0	2	2
Cap, veh/h				991	0	455	1232	2217	0	0	1425	349
Arrive On Green				0.28	0.28	0.28	0.36	0.62	0.00	0.00	0.22	0.22
Sat Flow, veh/h				3483	0	1598	3456	3647	0	0	6696	1576
Grp Volume(v), veh/h				402	0	390	1120	1011	0	0	859	230
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1728	1777	0	0	1609	1576
Q Serve(g_s), s				8.2	0.0	20.2	26.9	13.1	0.0	0.0	10.5	11.6
Cycle Q Clear(g_c), s				8.2	0.0	20.2	26.9	13.1	0.0	0.0	10.5	11.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				991	0	455	1232	2217	0	0	1425	349
V/C Ratio(X)				0.41	0.00	0.86	0.91	0.46	0.00	0.00	0.60	0.66
Avail Cap(c_a), veh/h				1715	0	786	1780	3621	0	0	2946	722
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				25.3	0.0	29.6	26.7	8.6	0.0	0.0	30.5	31.0
Incr Delay (d2), s/veh				0.1	0.0	1.9	4.2	0.1	0.0	0.0	0.2	0.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.1	0.0	7.3	10.7	3.9	0.0	0.0	3.8	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				25.4	0.0	31.4	30.9	8.7	0.0	0.0	30.7	31.8
LnGrp LOS				C	A	C	C	A	A	A	C	C
Approach Vol, veh/h					792			2131			1089	
Approach Delay, s/veh					28.4			20.4			30.9	
Approach LOS					C			C			C	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	58.5			35.1			23.3			28.8		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	15.1			28.9			13.6			22.2		
Green Ext Time (p_c), s	4.8			2.2			4.1			1.4		
Intersection Summary												
HCM 6th Ctrl Delay	24.8											
HCM 6th LOS	C											

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	460	10	770	0	0	0	0	1500	240	310	850	0
Future Volume (veh/h)	460	10	770	0	0	0	0	1500	240	310	850	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1885	1885	1870	1870	0
Adj Flow Rate, veh/h	500	0	844				0	1630	239	337	924	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	1	1	2	2	0
Cap, veh/h	1224	0	1089				0	2214	325	427	1923	0
Arrive On Green	0.35	0.00	0.35				0.00	0.38	0.37	0.12	0.54	0.00
Sat Flow, veh/h	3534	0	3145				0	6016	843	3456	3647	0
Grp Volume(v), veh/h	500	0	844				0	1378	491	337	924	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1621	1732	1728	1777	0
Q Serve(g_s), s	8.9	0.0	19.8				0.0	20.1	20.2	7.8	13.3	0.0
Cycle Q Clear(g_c), s	8.9	0.0	19.8				0.0	20.1	20.2	7.8	13.3	0.0
Prop In Lane	1.00		1.00				0.00		0.49	1.00		0.00
Lane Grp Cap(c), veh/h	1224	0	1089				0	1872	666	427	1923	0
V/C Ratio(X)	0.41	0.00	0.77				0.00	0.74	0.74	0.79	0.48	0.00
Avail Cap(c_a), veh/h	2951	0	2626				0	2472	880	711	2709	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.6	0.0	24.1				0.0	21.8	22.1	35.2	11.8	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.2				0.0	0.5	1.4	1.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	6.8				0.0	6.8	7.6	3.2	4.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	0.0	25.3				0.0	22.3	23.5	36.4	11.8	0.0
LnGrp LOS	C	A	C				A	C	C	D	B	A
Approach Vol, veh/h	1344						1869			1261		
Approach Delay, s/veh	23.6						22.6			18.4		
Approach LOS	C						C			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	4.2	35.8	32.6	50.0								
Change Period (Y+Rc), s	4.0	5.3	4.5	* 5.3								
Max Green Setting (Gmax), s	7.0	40.7	68.5	* 63								
Max Q Clear Time (g_c+I), s	19.8	22.2	21.8	15.3								
Green Ext Time (p_c), s	0.4	8.3	6.3	4.3								

### Intersection Summary

HCM 6th Ctrl Delay	21.7
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Cumulative AM Peak Hour

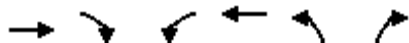


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	20	90	530	100	190	340	670	1370	60	790	60
Future Volume (veh/h)	30	20	90	530	100	190	340	670	1370	60	790	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1841	1841	1841	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	33	22	8	576	109	0	370	728	632	65	859	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	4	4	4	2	2	2	5	5	5
Cap, veh/h	46	98	36	716	364	0	410	1768	1367	97	1063	74
Arrive On Green	0.03	0.08	0.07	0.14	0.20	0.00	0.23	0.50	0.50	0.06	0.32	0.31
Sat Flow, veh/h	1697	1239	450	4944	1841	0	1781	3554	2747	1739	3289	230
Grp Volume(v), veh/h	33	0	30	576	109	0	370	728	632	65	453	466
Grp Sat Flow(s),veh/h/ln	1697	0	1689	1648	1841	0	1781	1777	1374	1739	1735	1784
Q Serve(g_s), s	1.4	0.0	1.2	8.1	3.6	0.0	14.5	9.3	10.8	2.6	17.2	17.2
Cycle Q Clear(g_c), s	1.4	0.0	1.2	8.1	3.6	0.0	14.5	9.3	10.8	2.6	17.2	17.2
Prop In Lane	1.00		0.27	1.00		0.00	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	46	0	134	716	364	0	410	1768	1367	97	560	576
V/C Ratio(X)	0.72	0.00	0.22	0.80	0.30	0.00	0.90	0.41	0.46	0.67	0.81	0.81
Avail Cap(c_a), veh/h	118	0	697	825	939	0	421	2386	1845	97	851	875
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	0.0	31.1	29.8	24.6	0.0	26.9	11.4	11.8	33.3	22.3	22.4
Incr Delay (d2), s/veh	7.8	0.0	0.3	4.4	0.2	0.0	21.3	0.1	0.1	13.9	1.8	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.5	3.2	1.5	0.0	7.9	3.0	2.7	1.4	6.4	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.6	0.0	31.4	34.1	24.8	0.0	48.3	11.5	11.9	47.2	24.2	24.2
LnGrp LOS	D	A	C	C	C	A	D	B	B	D	C	C
Approach Vol, veh/h	63		685			1730			984			
Approach Delay, s/veh	37.3		32.6			19.5			25.7			
Approach LOS	D		C			B			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	39.8	14.4	9.7	20.5	27.2	5.9	18.2				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	47.4	12.0	29.1	17.0	34.4	5.0	36.1				
Max Q Clear Time (g_c+14.6)	14.6	12.8	10.1	3.2	16.5	19.2	3.4	5.6				
Green Ext Time (p_c), s	0.0	4.9	0.3	0.1	0.0	3.0	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			24.2									
HCM 6th LOS			C									

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Cumulative AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	490	960	260	360	460	350
Future Volume (veh/h)	490	960	260	360	460	350
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1366	1366	1856	1856
Adj Flow Rate, veh/h	533	671	283	391	500	380
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	36	36	3	3
Cap, veh/h	1653	732	363	901	821	377
Arrive On Green	0.47	0.47	0.14	0.66	0.24	0.24
Sat Flow, veh/h	3647	1573	2525	1366	3428	1572
Grp Volume(v), veh/h	533	671	283	391	500	380
Grp Sat Flow(s),veh/h/ln	1777	1573	1262	1366	1714	1572
Q Serve(g_s), s	7.5	31.5	8.6	10.8	10.3	19.0
Cycle Q Clear(g_c), s	7.5	31.5	8.6	10.8	10.3	19.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1653	732	363	901	821	377
V/C Ratio(X)	0.32	0.92	0.78	0.43	0.61	1.01
Avail Cap(c_a), veh/h	1972	873	478	1086	821	377
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.3	19.8	32.7	6.4	26.8	30.1
Incr Delay (d2), s/veh	0.0	11.9	5.9	0.1	0.9	48.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	12.0	2.7	2.2	4.2	11.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.4	31.6	38.7	6.6	27.8	78.7
LnGrp LOS	B	C	D	A	C	F
Approach Vol, veh/h	1204			674	880	
Approach Delay, s/veh	23.6			20.0	49.8	
Approach LOS	C			C	D	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		23.0	15.4	40.9		56.3
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		19.0	14.5	43.4		62.4
Max Q Clear Time (g_c+I1), s		21.0	10.6	33.5		12.8
Green Ext Time (p_c), s		0.0	0.4	2.7		1.4
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			31.1			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱		↰↱↰↱					↑↑↑↑		↰↱↰↱	↑↑↑↑	
Traffic Volume (veh/h)	270	20	1090	0	0	0	0	2110	410	200	780	0
Future Volume (veh/h)	270	20	1090	0	0	0	0	2110	410	200	780	0
Initial Q (Qb), veh	0	0	60				0	60	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1826	1826	0
Adj Flow Rate, veh/h	293	22	657				0	2293	424	217	848	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	591	0	603				0	2880	398	280	3754	0
Arrive On Green	0.18	0.18	0.18				0.00	0.61	0.60	0.08	0.74	0.00
Sat Flow, veh/h	3456	0	3614				0	5042	786	3374	5149	0
Grp Volume(v), veh/h	293	0	657				0	1793	924	217	848	0
Grp Sat Flow(s),veh/h/ln	1728	0	1205				0	1122	1713	1687	1662	0
Q Serve(g_s), s	7.7	0.0	18.0				0.0	44.9	46.3	6.4	5.3	0.0
Cycle Q Clear(g_c), s	7.7	0.0	18.0				0.0	44.9	46.3	6.4	5.3	0.0
Prop In Lane	1.00		1.00				0.00		0.46	1.00		0.00
Lane Grp Cap(c), veh/h	591	0	603				0	2095	1075	280	3754	0
V/C Ratio(X)	0.50	0.00	1.09				0.00	0.86	0.86	0.77	0.23	0.00
Avail Cap(c_a), veh/h	612	0	640				0	2252	1146	398	3710	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.6	0.0	44.9				0.0	18.3	17.7	47.3	3.9	0.0
Incr Delay (d2), s/veh	0.2	0.0	63.1				0.0	3.0	6.0	3.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	358.0				0.0	23.0	10.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	28.7				0.0	17.2	22.1	2.8	1.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	0.0	466.0				0.0	44.3	33.7	50.8	3.9	0.0
LnGrp LOS	D	A	F				A	D	C	D	A	A
Approach Vol, veh/h	950						2717			1065		
Approach Delay, s/veh	334.5						40.7			13.4		
Approach LOS	F						D			B		
Timer - Assigned Phs	1	2		4			6					
Phs Duration (G+Y+Rc), s	3.4	66.2		22.0			79.7					
Change Period (Y+Rc), s	4.9	* 4.9		5.3			4.9					
Max Green Setting (Gmax), s	2.0	* 67		16.7			46.1					
Max Q Clear Time (g_c+I), s	13.4	48.3		20.0			7.3					
Green Ext Time (p_c), s	0.1	13.0		0.0			3.8					

### Intersection Summary

HCM 6th Ctrl Delay	93.6
HCM 6th LOS	F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Contra Loma Plaza/Davison Drive

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Traffic Volume (veh/h)	40	30	30	220	40	260	40	1710	170	180	870	30
Future Volume (veh/h)	40	30	30	220	40	260	40	1710	170	180	870	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	33	0	239	43	28	43	1859	182	196	946	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	1	1	1	2	2	2	2	2	2
Cap, veh/h	74	57	115	279	293	248	55	1887	182	251	2165	73
Arrive On Green	0.07	0.07	0.00	0.16	0.16	0.16	0.03	0.58	0.57	0.07	0.62	0.61
Sat Flow, veh/h	1021	784	1572	1795	1885	1595	1781	3274	315	3456	3504	119
Grp Volume(v), veh/h	76	0	0	239	43	28	43	994	1047	196	480	498
Grp Sat Flow(s), veh/h/ln	1804	0	1572	1795	1885	1595	1781	1777	1813	1728	1777	1846
Q Serve(g_s), s	5.3	0.0	0.0	16.9	2.6	2.0	3.1	70.1	75.0	7.3	18.4	18.4
Cycle Q Clear(g_c), s	5.3	0.0	0.0	16.9	2.6	2.0	3.1	70.1	75.0	7.3	18.4	18.4
Prop In Lane	0.57		1.00	1.00		1.00	1.00		0.17	1.00		0.06
Lane Grp Cap(c), veh/h	131	0	115	279	293	248	55	1024	1045	251	1098	1140
V/C Ratio(X)	0.58	0.00	0.00	0.86	0.15	0.11	0.78	0.97	1.00	0.78	0.44	0.44
Avail Cap(c_a), veh/h	485	0	423	524	550	466	219	1024	1045	425	1098	1140
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	0.0	0.0	53.5	47.5	47.3	62.6	26.5	27.6	59.3	13.0	13.0
Incr Delay (d2), s/veh	1.5	0.0	0.0	3.0	0.1	0.1	8.3	21.2	28.3	2.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	7.7	1.2	0.8	1.5	32.6	37.2	3.3	7.2	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.9	0.0	0.0	56.5	47.6	47.3	70.9	47.8	56.0	61.4	13.1	13.1
LnGrp LOS	E	A	A	E	D	D	E	D	F	E	B	B
Approach Vol, veh/h	76			310			2084			1174		
Approach Delay, s/veh	59.9			54.4			52.4			21.2		
Approach LOS	E			D			D			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.4	79.0		13.5	8.1	84.4		24.2				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+1.9), s	19.3	77.0		7.3	5.1	20.4		18.9				
Green Ext Time (p_c), s	0.2	0.0		0.2	0.0	4.7		0.4				

### Intersection Summary

HCM 6th Ctrl Delay	42.6
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	150	90	90	200	900	100	1020	30	540	960	150
Future Volume (veh/h)	160	150	90	90	200	900	100	1020	30	540	960	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	174	163	35	98	217	978	109	1109	32	587	1043	84
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	2	2	2
Cap, veh/h	195	1036	217	112	1104	1370	255	1065	31	632	1181	687
Arrive On Green	0.11	0.36	0.35	0.06	0.31	0.30	0.14	0.30	0.29	0.18	0.33	0.32
Sat Flow, veh/h	1781	2915	610	1795	3582	2812	1795	3554	103	3456	3554	1582
Grp Volume(v), veh/h	174	98	100	98	217	978	109	559	582	587	1043	84
Grp Sat Flow(s), veh/h/ln	1781	1777	1749	1795	1791	1406	1795	1791	1865	1728	1777	1582
Q Serve(g_s), s	15.4	6.0	6.3	8.7	7.1	43.8	8.9	48.0	48.0	26.8	44.4	3.0
Cycle Q Clear(g_c), s	15.4	6.0	6.3	8.7	7.1	43.8	8.9	48.0	48.0	26.8	44.4	3.0
Prop In Lane	1.00		0.35	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	195	631	621	112	1104	1370	255	537	559	632	1181	687
V/C Ratio(X)	0.89	0.15	0.16	0.87	0.20	0.71	0.43	1.04	1.04	0.93	0.88	0.12
Avail Cap(c_a), veh/h	256	821	808	112	1364	1574	255	537	559	690	1531	842
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.4	35.2	35.4	74.5	40.8	32.3	62.8	56.1	56.1	64.4	50.5	12.0
Incr Delay (d2), s/veh	21.7	0.0	0.0	47.0	0.0	1.0	0.4	50.0	49.3	17.5	4.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	2.6	2.7	5.4	3.2	14.6	4.0	28.6	29.7	13.4	20.5	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	92.1	35.3	35.4	121.4	40.8	33.3	63.2	106.1	105.5	81.9	54.9	12.0
LnGrp LOS	F	D	D	F	D	C	E	F	F	F	D	B
Approach Vol, veh/h					1293				1250			
Approach Delay, s/veh					41.2				102.1			
Approach LOS	E				D				F			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.3	52.0	14.0	60.9	28.0	57.3	21.5	53.4				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	32.0	46.7	10.0	73.4	11.0	* 68	23.0	60.4				
Max Q Clear Time (g_c+20.0), s	20.8	50.0	10.7	8.3	10.9	46.4	17.4	45.8				
Green Ext Time (p_c), s	0.5	0.0	0.0	0.6	0.0	5.5	0.1	3.0				

### Intersection Summary

HCM 6th Ctrl Delay	67.0
HCM 6th LOS	E

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	60	900	10	150	90	830	1320	20	80	890	170
Future Volume (veh/h)	200	60	900	10	150	90	830	1320	20	80	890	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	141	171	111	11	163	8	902	1435	9	87	967	164
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	2	2	2
Cap, veh/h	224	235	399	15	217	193	995	1850	806	112	1253	212
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.29	0.52	0.52	0.06	0.29	0.28
Sat Flow, veh/h	1795	1885	3195	118	1747	1556	3483	3582	1561	1781	4382	741
Grp Volume(v), veh/h	141	171	111	174	0	8	902	1435	9	87	750	381
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1864	0	1556	1742	1791	1561	1781	1702	1719
Q Serve(g_s), s	6.9	8.1	2.9	8.4	0.0	0.4	23.2	30.1	0.3	4.5	18.8	18.9
Cycle Q Clear(g_c), s	6.9	8.1	2.9	8.4	0.0	0.4	23.2	30.1	0.3	4.5	18.8	18.9
Prop In Lane	1.00		1.00	0.06		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	224	235	399	231	0	193	995	1850	806	112	973	492
V/C Ratio(X)	0.63	0.73	0.28	0.75	0.00	0.04	0.91	0.78	0.01	0.78	0.77	0.77
Avail Cap(c_a), veh/h	347	365	618	781	0	652	1235	2155	940	211	1244	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.7	39.2	36.9	39.4	0.0	35.9	32.1	18.2	10.9	43.0	30.4	30.6
Incr Delay (d2), s/veh	1.1	1.6	0.1	1.9	0.0	0.0	7.5	1.3	0.0	4.4	1.7	3.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	3.7	1.1	3.8	0.0	0.2	10.1	11.0	0.1	2.1	7.7	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	40.8	37.1	41.2	0.0	35.9	39.6	19.4	10.9	47.4	32.1	33.9
LnGrp LOS	D	D	D	D	A	D	D	B	B	D	C	C
Approach Vol, veh/h	423			182			2346			1218		
Approach Delay, s/veh	39.5			41.0			27.1			33.8		
Approach LOS	D			D			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.8	52.1		15.6	30.6	31.3		15.6				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	1.0	54.7		17.1	33.0	* 33		39.0				
Max Q Clear Time (g_c+10), s	10.5	32.1		10.1	25.2	20.9		10.4				
Green Ext Time (p_c), s	0.0	7.1		0.6	1.3	4.4		0.5				

### Intersection Summary

HCM 6th Ctrl Delay	30.9
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵ ↑↑↑			↵ ↑↑↑			↵↵	↑	↵	↵	↵	
Traffic Volume (veh/h)	50	1020	200	200	1290	80	330	150	180	70	180	120
Future Volume (veh/h)	50	1020	200	200	1290	80	330	150	180	70	180	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	54	1109	109	217	1402	16	359	163	22	76	196	112
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	70	1393	137	253	2072	24	439	647	535	98	303	173
Arrive On Green	0.04	0.29	0.29	0.14	0.40	0.39	0.13	0.34	0.34	0.05	0.27	0.26
Sat Flow, veh/h	1795	4756	467	1795	5244	60	3483	1885	1558	1810	1117	639
Grp Volume(v), veh/h	54	800	418	217	917	501	359	163	22	76	0	308
Grp Sat Flow(s),veh/h/ln	1795	1716	1792	1795	1716	1873	1742	1885	1558	1810	0	1756
Q Serve(g_s), s	2.8	20.4	20.4	11.2	20.9	20.9	9.5	5.9	0.9	3.9	0.0	14.7
Cycle Q Clear(g_c), s	2.8	20.4	20.4	11.2	20.9	20.9	9.5	5.9	0.9	3.9	0.0	14.7
Prop In Lane	1.00		0.26	1.00		0.03	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	70	1005	525	253	1355	740	439	647	535	98	0	477
V/C Ratio(X)	0.78	0.80	0.80	0.86	0.68	0.68	0.82	0.25	0.04	0.77	0.00	0.65
Avail Cap(c_a), veh/h	170	1498	782	454	2040	1114	698	946	782	210	0	733
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.2	30.9	31.0	39.8	23.7	23.7	40.4	22.4	20.8	44.3	0.0	30.7
Incr Delay (d2), s/veh	6.8	1.0	1.9	3.3	0.2	0.4	1.9	0.1	0.0	4.8	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	8.0	8.5	4.9	7.8	8.5	4.0	2.5	0.3	1.8	0.0	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.9	31.9	32.9	43.1	23.9	24.1	42.3	22.5	20.8	49.0	0.0	31.3
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	A	C
Approach Vol, veh/h	1272					1635		544		384		
Approach Delay, s/veh	33.1					26.5		35.5		34.8		
Approach LOS	C					C		D		C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	36.5	17.4	31.8	16.0	29.8	7.7	41.5				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax),s	1.0	46.3	24.0	* 41	19.0	38.3	9.0	* 56				
Max Q Clear Time (g_c+15),s	1.0	7.9	13.2	22.4	11.5	16.7	4.8	22.9				
Green Ext Time (p_c), s	0.0	0.5	0.2	4.8	0.4	1.0	0.0	6.6				

### Intersection Summary

HCM 6th Ctrl Delay	30.8
HCM 6th LOS	C



























### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Cumulative AM Peak Hour





												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	40	760	310	290	970	310	420	400	120	390	580	30
Future Volume (veh/h)	40	760	310	290	970	310	420	400	120	390	580	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	43	826	84	315	1054	129	457	435	107	424	630	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	55	1254	127	344	1969	241	517	741	181	488	878	42
Arrive On Green	0.03	0.27	0.25	0.19	0.43	0.42	0.15	0.26	0.25	0.14	0.25	0.24
Sat Flow, veh/h	1795	4720	477	1781	4602	562	3483	2839	692	3483	3475	165
Grp Volume(v), veh/h	43	599	311	315	779	404	457	273	269	424	324	336
Grp Sat Flow(s),veh/h/ln	1795	1716	1766	1781	1702	1760	1742	1791	1740	1742	1791	1849
Q Serve(g_s), s	2.7	17.7	17.9	19.8	19.4	19.5	14.7	15.1	15.5	13.6	18.8	18.9
Cycle Q Clear(g_c), s	2.7	17.7	17.9	19.8	19.4	19.5	14.7	15.1	15.5	13.6	18.8	18.9
Prop In Lane	1.00		0.27	1.00		0.32	1.00		0.40	1.00		0.09
Lane Grp Cap(c), veh/h	55	911	469	344	1456	753	517	467	454	488	452	467
V/C Ratio(X)	0.78	0.66	0.66	0.92	0.54	0.54	0.88	0.58	0.59	0.87	0.72	0.72
Avail Cap(c_a), veh/h	94	1144	589	422	1762	911	580	613	595	611	628	649
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.9	37.2	37.5	45.1	24.2	24.4	47.6	36.7	37.1	48.0	38.9	39.0
Incr Delay (d2), s/veh	8.5	0.5	1.0	20.0	0.1	0.2	12.9	0.4	0.5	9.2	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	7.2	7.6	10.3	7.4	7.7	7.1	6.4	6.4	6.3	8.1	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.3	37.7	38.5	65.1	24.3	24.6	60.5	37.2	37.5	57.2	40.0	40.0
LnGrp LOS	E	D	D	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h		953			1498			999			1084	
Approach Delay, s/veh		39.1			33.0			47.9			46.8	
Approach LOS		D			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.0	33.8	26.0	34.3	20.9	32.8	7.5	52.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+I1), s	15.6	17.5	21.8	19.9	16.7	20.9	4.7	21.5				
Green Ext Time (p_c), s	0.4	1.8	0.2	3.3	0.3	2.1	0.0	5.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				40.9								
HCM 6th LOS				D								

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	320	950	120	110	1220	310	300	490	260	480	220	320
Future Volume (veh/h)	320	950	120	110	1220	310	300	490	260	480	220	320
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	337	1000	49	116	1284	133	316	516	212	505	232	190
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	239	1918	94	145	1695	524	222	659	269	359	878	384
Arrive On Green	0.13	0.38	0.37	0.08	0.33	0.33	0.12	0.27	0.25	0.10	0.25	0.25
Sat Flow, veh/h	1781	4982	244	1781	5106	1578	1795	2478	1014	3483	3582	1568
Grp Volume(v), veh/h	337	683	366	116	1284	133	316	372	356	505	232	190
Grp Sat Flow(s),veh/h/ln	1781	1702	1822	1781	1702	1578	1795	1791	1701	1742	1791	1568
Q Serve(g_s), s	13.0	15.0	15.0	6.2	21.8	6.0	12.0	18.7	18.9	10.0	5.1	10.1
Cycle Q Clear(g_c), s	13.0	15.0	15.0	6.2	21.8	6.0	12.0	18.7	18.9	10.0	5.1	10.1
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.60	1.00		1.00
Lane Grp Cap(c), veh/h	239	1310	701	145	1695	524	222	476	452	359	878	384
V/C Ratio(X)	1.41	0.52	0.52	0.80	0.76	0.25	1.42	0.78	0.79	1.41	0.26	0.49
Avail Cap(c_a), veh/h	239	1696	908	202	2439	754	222	826	784	359	1578	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	22.9	23.0	43.8	28.9	23.6	42.5	33.0	33.4	43.5	29.5	31.4
Incr Delay (d2), s/veh	207.9	0.1	0.2	9.8	0.4	0.1	214.0	1.1	1.2	198.5	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	5.6	6.0	3.0	8.3	2.1	18.3	7.8	7.5	14.0	2.1	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	249.8	23.1	23.3	53.6	29.3	23.7	256.5	34.1	34.6	241.9	29.6	31.8
LnGrp LOS	F	C	C	D	C	C	F	C	C	F	C	C
Approach Vol, veh/h	1386			1533			1044			927		
Approach Delay, s/veh	78.3			30.7			101.6			145.7		
Approach LOS	E			C			F			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.0	29.8	11.9	41.3	16.0	27.8	17.0	36.2				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	4.0	43.4	11.0	47.0	12.0	41.4	13.0	45.0				
Max Q Clear Time (g_c+1/2), s	4.0	20.9	8.2	17.0	14.0	12.1	15.0	23.8				
Green Ext Time (p_c), s	0.0	2.6	0.0	4.4	0.0	1.1	0.0	6.1				

### Intersection Summary

HCM 6th Ctrl Delay	81.1
HCM 6th LOS	F

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1800	850	290	1500	0	0	0	0	790	10	920
Future Volume (veh/h)	0	1800	850	290	1500	0	0	0	0	790	10	920
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1957	456	315	1630	0				867	0	972
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	1	1	0				2	2	2
Cap, veh/h	0	1691	524	226	2426	0				1680	0	747
Arrive On Green	0.00	0.33	0.33	0.11	0.47	0.00				0.47	0.00	0.47
Sat Flow, veh/h	0	5316	1596	1975	5316	0				3563	0	1585
Grp Volume(v), veh/h	0	1957	456	315	1630	0				867	0	972
Grp Sat Flow(s),veh/h/ln	0	1716	1596	987	1716	0				1781	0	1585
Q Serve(g_s), s	0.0	46.0	37.6	16.0	34.3	0.0				23.8	0.0	66.0
Cycle Q Clear(g_c), s	0.0	46.0	37.6	16.0	34.3	0.0				23.8	0.0	66.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1691	524	226	2426	0				1680	0	747
V/C Ratio(X)	0.00	1.16	0.87	1.40	0.67	0.00				0.52	0.00	1.30
Avail Cap(c_a), veh/h	0	1691	524	226	2426	0				1680	0	747
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	47.0	44.2	62.0	28.6	0.0				25.8	0.0	37.0
Incr Delay (d2), s/veh	0.0	77.9	14.0	202.7	0.6	0.0				0.1	0.0	145.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	31.1	16.4	10.3	13.6	0.0				9.8	0.0	54.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	124.9	58.2	264.7	29.2	0.0				26.0	0.0	182.1
LnGrp LOS	A	F	E	F	C	A				C	A	F
Approach Vol, veh/h		2413			1945						1839	
Approach Delay, s/veh		112.3			67.4						108.5	
Approach LOS		F			E						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	30.0	50.0		70.0		70.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	60.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I1), s	11.0	48.0		68.0		36.3						
Green Ext Time (p_c), s	0.0	0.0		0.0		8.8						

### Intersection Summary

HCM 6th Ctrl Delay	97.1
HCM 6th LOS	F

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1920	670	170	1030	620	760	50	930	0	0	0
Future Volume (veh/h)	0	1920	670	170	1030	620	760	50	930	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	0	2087	449	185	1120	321	865	0	876			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2			
Cap, veh/h	0	2042	633	163	2681	809	1455	0	647			
Arrive On Green	0.00	0.40	0.40	0.09	0.52	0.52	0.41	0.00	0.41			
Sat Flow, veh/h	0	5274	1583	1781	5106	1540	3563	0	1584			
Grp Volume(v), veh/h	0	2087	449	185	1120	321	865	0	876			
Grp Sat Flow(s),veh/h/ln	0	1702	1583	1781	1702	1540	1781	0	1584			
Q Serve(g_s), s	0.0	48.0	28.5	11.0	16.0	15.0	22.8	0.0	49.0			
Cycle Q Clear(g_c), s	0.0	48.0	28.5	11.0	16.0	15.0	22.8	0.0	49.0			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2042	633	163	2681	809	1455	0	647			
V/C Ratio(X)	0.00	1.02	0.71	1.13	0.42	0.40	0.59	0.00	1.35			
Avail Cap(c_a), veh/h	0	2042	633	163	2681	809	1455	0	647			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	36.0	30.2	54.5	17.3	17.1	27.7	0.0	35.5			
Incr Delay (d2), s/veh	0.0	25.6	3.2	110.6	0.0	0.1	0.5	0.0	169.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	23.5	10.8	9.8	5.9	5.0	9.3	0.0	48.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	61.6	33.3	165.1	17.4	17.2	28.2	0.0	205.0			
LnGrp LOS	A	F	C	F	B	B	C	A	F			
Approach Vol, veh/h	2536			1626			1741					
Approach Delay, s/veh	56.6			34.2			117.2					
Approach LOS	E			C			F					
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.0	52.0		53.0		67.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	1.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+I1), s	1.0	50.0		51.0		18.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		6.2						

## Intersection Summary

HCM 6th Ctrl Delay 68.3

HCM 6th LOS E

## Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	170	10	10	70	370	10	160	20	410	310	80
Future Volume (veh/h)	80	170	10	10	70	370	10	160	20	410	310	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.95	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	87	185	10	11	76	251	11	174	11	446	337	69
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	138	499	27	105	98	325	106	500	31	491	1067	216
Arrive On Green	0.08	0.28	0.28	0.06	0.27	0.27	0.06	0.15	0.13	0.27	0.36	0.34
Sat Flow, veh/h	1781	1757	95	1767	370	1223	1795	3411	214	1795	2961	598
Grp Volume(v), veh/h	87	0	195	11	0	327	11	91	94	446	202	204
Grp Sat Flow(s),veh/h/ln	1781	0	1851	1767	0	1593	1795	1791	1834	1795	1791	1768
Q Serve(g_s), s	3.2	0.0	5.7	0.4	0.0	12.8	0.4	3.1	3.1	16.2	5.5	5.7
Cycle Q Clear(g_c), s	3.2	0.0	5.7	0.4	0.0	12.8	0.4	3.1	3.1	16.2	5.5	5.7
Prop In Lane	1.00		0.05	1.00		0.77	1.00		0.12	1.00		0.34
Lane Grp Cap(c), veh/h	138	0	526	105	0	423	106	262	269	491	646	637
V/C Ratio(X)	0.63	0.00	0.37	0.11	0.00	0.77	0.10	0.35	0.35	0.91	0.31	0.32
Avail Cap(c_a), veh/h	290	0	988	288	0	850	559	1353	1385	559	1353	1336
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	0.0	19.3	30.1	0.0	22.9	30.1	25.9	26.0	23.7	15.6	15.8
Incr Delay (d2), s/veh	1.8	0.0	0.2	0.2	0.0	1.1	0.2	0.3	0.3	16.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	2.2	0.2	0.0	4.3	0.2	1.2	1.3	8.2	1.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.0	0.0	19.5	30.2	0.0	24.1	30.2	26.2	26.3	40.1	15.7	15.9
LnGrp LOS	C	A	B	C	A	C	C	C	C	D	B	B
Approach Vol, veh/h	282		338			196			852			
Approach Delay, s/veh	23.3		24.3			26.5			28.5			
Approach LOS	C		C			C			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.4	13.9	8.0	23.2	8.0	28.3	9.2	21.9				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+I1), s	5.1	5.1	2.4	7.7	2.4	7.7	5.2	14.8				
Green Ext Time (p_c), s	0.2	0.6	0.0	0.6	0.0	1.4	0.0	1.2				

### Intersection Summary

HCM 6th Ctrl Delay	26.5
HCM 6th LOS	C











# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	210	210	280	210	160	140	710	180	150	1150	140
Future Volume (veh/h)	140	210	210	280	210	160	140	710	180	150	1150	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	152	228	194	304	228	149	152	772	176	163	1250	143
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	180	244	208	306	349	228	139	944	215	185	1137	130
Arrive On Green	0.10	0.26	0.26	0.17	0.33	0.33	0.08	0.33	0.32	0.10	0.35	0.34
Sat Flow, veh/h	1795	934	794	1781	1047	684	1795	2894	660	1795	3231	368
Grp Volume(v), veh/h	152	0	422	304	0	377	152	478	470	163	691	702
Grp Sat Flow(s),veh/h/ln	1795	0	1728	1781	0	1731	1795	1791	1763	1795	1791	1808
Q Serve(g_s), s	9.7	0.0	27.8	19.9	0.0	21.6	9.0	28.6	28.6	10.4	41.0	41.0
Cycle Q Clear(g_c), s	9.7	0.0	27.8	19.9	0.0	21.6	9.0	28.6	28.6	10.4	41.0	41.0
Prop In Lane	1.00		0.46	1.00		0.40	1.00		0.37	1.00		0.20
Lane Grp Cap(c), veh/h	180	0	452	306	0	577	139	584	575	185	630	636
V/C Ratio(X)	0.85	0.00	0.93	0.99	0.00	0.65	1.10	0.82	0.82	0.88	1.10	1.10
Avail Cap(c_a), veh/h	231	0	504	306	0	580	139	584	575	185	630	636
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	0.0	42.0	48.2	0.0	33.1	53.8	36.1	36.3	51.6	37.8	37.9
Incr Delay (d2), s/veh	16.4	0.0	22.2	49.7	0.0	2.1	104.4	8.4	8.5	34.4	64.8	67.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.0	14.1	12.7	0.0	9.0	8.0	13.2	13.1	6.3	28.3	29.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.9	0.0	64.2	97.9	0.0	35.2	158.2	44.4	44.8	85.9	102.6	105.5
LnGrp LOS	E	A	E	F	A	D	F	D	D	F	F	F
Approach Vol, veh/h	574			681			1100			1556		
Approach Delay, s/veh	65.2			63.2			60.3			102.2		
Approach LOS	E			E			E			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	42.0	24.0	34.5	13.0	45.0	15.7	42.8					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	36.7	20.0	34.0	9.0	39.7	15.0	39.0					
Max Q Clear Time (g_c+I1), s	30.6	21.9	29.8	11.0	43.0	11.7	23.6					
Green Ext Time (p_c), s	0.0	2.0	0.0	0.7	0.0	0.0	0.1	1.2				

### Intersection Summary

HCM 6th Ctrl Delay	78.2
HCM 6th LOS	E

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Cumulative AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	50	170	1060	70	360	1090
Future Volume (veh/h)	50	170	1060	70	360	1090
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.97	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1885	1885	1885	1885
Adj Flow Rate, veh/h	54	7	1152	42	391	1185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	85	76	1571	683	455	2790
Arrive On Green	0.05	0.05	0.44	0.44	0.25	0.78
Sat Flow, veh/h	1810	1610	3676	1557	1795	3676
Grp Volume(v), veh/h	54	7	1152	42	391	1185
Grp Sat Flow(s), veh/h/ln	1810	1610	1791	1557	1795	1791
Q Serve(g_s), s	1.3	0.2	12.2	0.7	9.6	5.0
Cycle Q Clear(g_c), s	1.3	0.2	12.2	0.7	9.6	5.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	85	76	1571	683	455	2790
V/C Ratio(X)	0.63	0.09	0.73	0.06	0.86	0.42
Avail Cap(c_a), veh/h	1377	1226	2259	982	547	3661
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	21.0	10.7	7.5	16.4	1.7
Incr Delay (d2), s/veh	2.9	0.2	0.3	0.0	9.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.1	3.2	0.2	4.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.4	21.2	11.0	7.5	26.3	1.7
LnGrp LOS	C	C	B	A	C	A
Approach Vol, veh/h	61		1194			1576
Approach Delay, s/veh	24.0		10.9			7.8
Approach LOS	C		B			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.7	24.2			39.8	6.2
Change Period (Y+Rc), s	4.0	5.3			5.3	4.0
Max Green Setting (Gmax), s	4.0	27.7			45.7	35.0
Max Q Clear Time (g_c+I1), s	11.6	14.2			7.0	3.3
Green Ext Time (p_c), s	0.2	4.5			6.0	0.1

### Intersection Summary








HCM 6th Ctrl Delay		9.5	
HCM 6th LOS		A	

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	90	60	450	0	460	70	570	690	20
Future Volume (veh/h)	0	0	0	90	60	450	0	460	70	570	690	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	0	0	0	98	65	71	0	500	66	620	750	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	0	6	0	186	185	165	5	920	121	891	2352	66
Arrive On Green	0.00	0.00	0.00	0.10	0.10	0.10	0.00	0.29	0.25	0.26	0.66	0.62
Sat Flow, veh/h	0	1900	0	1795	1791	1594	1810	3202	421	3483	3559	100
Grp Volume(v), veh/h	0	0	0	98	65	71	0	281	285	620	377	394
Grp Sat Flow(s),veh/h/ln	0	1900	0	1795	1791	1594	1810	1805	1818	1742	1791	1867
Q Serve(g_s), s	0.0	0.0	0.0	1.8	1.1	1.4	0.0	4.5	4.5	5.5	3.1	3.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.8	1.1	1.4	0.0	4.5	4.5	5.5	3.1	3.1
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.23	1.00		0.05
Lane Grp Cap(c), veh/h	0	6	0	186	185	165	5	519	522	891	1184	1234
V/C Ratio(X)	0.00	0.00	0.00	0.53	0.35	0.43	0.00	0.54	0.55	0.70	0.32	0.32
Avail Cap(c_a), veh/h	0	1483	0	952	2057	1830	213	2153	2168	4000	3982	4151
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	14.4	14.2	14.3	0.0	10.2	10.4	11.4	2.5	2.5
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.3	0.4	0.7	0.0	0.3	0.3	0.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.6	0.4	0.4	0.0	1.1	1.1	1.6	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	16.7	14.6	14.9	0.0	10.5	10.7	11.8	2.5	2.5
LnGrp LOS	A	A	A	B	B	B	A	B	B	B	A	A
Approach Vol, veh/h	0			234			566			1391		
Approach Delay, s/veh	0.0			15.6			10.6			6.7		
Approach LOS				B			B			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), \$2.7	13.8	7.5	0.0	0.0	26.4	0.0	7.5					
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0				
Max Green Setting (Gmax), s	39.0	39.2	17.5	26.5	4.0	74.2	5.0	39.0				
Max Q Clear Time (g_c+17), s	11.5	6.5	3.8	0.0	0.0	5.1	0.0	3.4				
Green Ext Time (p_c), s	1.2	1.9	0.2	0.0	0.0	3.4	0.0	0.4				

### Intersection Summary









HCM 6th Ctrl Delay	8.6
HCM 6th LOS	A

# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	540	30	90	860	130	150	210	270	120	50	150
Future Volume (veh/h)	110	540	30	90	860	130	150	210	270	120	50	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	587	29	98	935	130	163	228	92	130	54	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	1206	60	131	1055	147	199	851	333	165	624	466
Arrive On Green	0.09	0.35	0.35	0.07	0.34	0.33	0.11	0.34	0.34	0.09	0.32	0.32
Sat Flow, veh/h	1781	3447	170	1781	3133	436	1781	2495	976	1781	1938	1448
Grp Volume(v), veh/h	120	302	314	98	530	535	163	160	160	130	49	50
Grp Sat Flow(s),veh/h/ln	1781	1777	1840	1781	1777	1792	1781	1777	1695	1781	1777	1610
Q Serve(g_s), s	7.4	14.9	15.0	6.0	31.6	31.6	10.0	7.3	7.7	8.0	2.2	2.4
Cycle Q Clear(g_c), s	7.4	14.9	15.0	6.0	31.6	31.6	10.0	7.3	7.7	8.0	2.2	2.4
Prop In Lane	1.00		0.09	1.00		0.24	1.00		0.58	1.00		0.90
Lane Grp Cap(c), veh/h	154	622	644	131	598	603	199	606	578	165	572	518
V/C Ratio(X)	0.78	0.49	0.49	0.75	0.89	0.89	0.82	0.26	0.28	0.79	0.09	0.10
Avail Cap(c_a), veh/h	188	635	657	210	657	662	240	606	578	200	572	518
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.1	28.5	28.6	50.9	35.1	35.2	48.6	26.7	27.0	49.7	26.5	26.7
Incr Delay (d2), s/veh	15.3	0.6	0.6	8.3	13.0	13.0	16.7	1.1	1.2	15.6	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	6.2	6.4	2.9	15.1	15.2	5.2	3.2	3.2	4.2	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.4	29.1	29.1	59.1	48.1	48.2	65.3	27.8	28.1	65.3	26.8	27.1
LnGrp LOS	E	C	C	E	D	D	E	C	C	E	C	C
Approach Vol, veh/h	736			1163			483			229		
Approach Delay, s/veh	35.0			49.1			40.6			48.7		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.4	42.2	12.2	43.2	16.5	40.0	13.7	41.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	37.7	12.7	39.5	14.6	35.2	11.3	40.9					
Max Q Clear Time (g_c+I10), s	9.7	8.0	17.0	12.0	4.4	9.4	33.6					
Green Ext Time (p_c), s	0.1	1.7	0.1	3.4	0.1	0.5	0.0	3.6				

### Intersection Summary

HCM 6th Ctrl Delay 43.5

HCM 6th LOS D

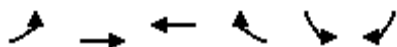
### Notes

User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

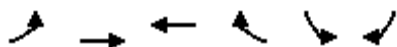
The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	60	870	1030	880	310	50
Future Volume (veh/h)	60	870	1030	880	310	50
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	63	916	1084	453	326	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	107	2023	1592	710	1063	488
Arrive On Green	0.06	0.57	0.45	0.45	0.31	0.31
Sat Flow, veh/h	1781	3647	3647	1585	3456	1585
Grp Volume(v), veh/h	63	916	1084	453	326	12
Grp Sat Flow(s), veh/h/ln	1781	1777	1777	1585	1728	1585
Q Serve(g_s), s	2.2	9.7	15.8	14.4	4.7	0.3
Cycle Q Clear(g_c), s	2.2	9.7	15.8	14.4	4.7	0.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	107	2023	1592	710	1063	488
V/C Ratio(X)	0.59	0.45	0.68	0.64	0.31	0.02
Avail Cap(c_a), veh/h	219	3389	2733	1219	1063	488
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	8.1	14.3	13.9	17.2	15.7
Incr Delay (d2), s/veh	5.1	0.2	0.5	1.0	0.7	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.0	2.7	5.1	4.2	1.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	34.9	8.3	14.8	14.8	18.0	15.8
LnGrp LOS	C	A	B	B	B	B
Approach Vol, veh/h		979	1537		338	
Approach Delay, s/veh		10.0	14.8		17.9	
Approach LOS		A	B		B	
Timer - Assigned Phs			4	6	7	8
Phs Duration (G+Y+Rc), s			41.0	24.0	7.9	33.1
Change Period (Y+Rc), s			4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s			61.5	19.5	7.5	49.5
Max Q Clear Time (g_c+I1), s			11.7	6.7	4.2	17.8
Green Ext Time (p_c), s			7.1	0.9	0.0	10.9
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			13.5			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	320	1000	1810	570	960	180
Future Volume (veh/h)	320	1000	1810	570	960	180
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	337	1053	1905	392	1011	64
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	312	3617	1777	793	784	359
Arrive On Green	0.17	0.71	0.50	0.50	0.22	0.22
Sat Flow, veh/h	1781	5274	3647	1585	3483	1598
Grp Volume(v), veh/h	337	1053	1905	392	1011	64
Grp Sat Flow(s), veh/h/ln	1781	1702	1777	1585	1742	1598
Q Serve(g_s), s	21.0	9.1	60.0	19.7	27.0	3.9
Cycle Q Clear(g_c), s	21.0	9.1	60.0	19.7	27.0	3.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	312	3617	1777	793	784	359
V/C Ratio(X)	1.08	0.29	1.07	0.49	1.29	0.18
Avail Cap(c_a), veh/h	312	3617	1777	793	784	359
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	6.4	30.0	19.9	46.5	37.5
Incr Delay (d2), s/veh	74.3	0.0	43.7	0.2	140.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	2.7	34.1	6.9	26.5	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	123.8	6.4	73.7	20.1	186.5	37.6
LnGrp LOS	F	A	F	C	F	D
Approach Vol, veh/h		1390	2297		1075	
Approach Delay, s/veh		34.9	64.5		177.7	
Approach LOS		C	E		F	
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		89.0			25.0	64.0
Change Period (Y+Rc), s		5.3			4.5	5.3
Max Green Setting (Gmax), s		83.7			20.5	58.7
Max Q Clear Time (g_c+I1), s		11.1			23.0	62.0
Green Ext Time (p_c), s		5.1			0.0	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			81.4			
HCM 6th LOS			F			

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Cumulative AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↑			↑↑	↰	↰	↰	↰			
Traffic Volume (veh/h)	490	1470	0	0	1830	1170	550	10	220	0	0	0
Future Volume (veh/h)	490	1470	0	0	1830	1170	550	10	220	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	533	1598	0	0	2032	1009	606	0	192			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	409	3609	0	0	2040	865	754	0	335			
Arrive On Green	0.12	0.70	0.00	0.00	0.54	0.54	0.21	0.00	0.21			
Sat Flow, veh/h	3483	5316	0	0	3770	1598	3534	0	1572			
Grp Volume(v), veh/h	533	1598	0	0	2032	1009	606	0	192			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	11.0	12.6	0.0	0.0	50.3	50.7	15.3	0.0	10.3			
Cycle Q Clear(g_c), s	11.0	12.6	0.0	0.0	50.3	50.7	15.3	0.0	10.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	409	3609	0	0	2040	865	754	0	335			
V/C Ratio(X)	1.30	0.44	0.00	0.00	1.00	1.17	0.80	0.00	0.57			
Avail Cap(c_a), veh/h	409	3609	0	0	2040	865	1747	0	777			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	41.3	6.1	0.0	0.0	21.4	21.5	35.0	0.0	33.0			
Incr Delay (d2), s/veh	153.3	0.0	0.0	0.0	18.9	87.7	0.8	0.0	0.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.2	3.3	0.0	0.0	23.8	36.9	6.3	0.0	9.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	194.7	6.1	0.0	0.0	40.3	109.2	35.8	0.0	33.6			
LnGrp LOS	F	A	A	A	D	F	D	A	C			
Approach Vol, veh/h	2131		3041			798						
Approach Delay, s/veh	53.3		63.1			35.2						
Approach LOS	D		E			D						
Timer - Assigned Phs	2		4		5	6						
Phs Duration (G+Y+Rc), s	69.7		24.0		15.0	54.7						
Change Period (Y+Rc), s	5.3		5.3		4.0	5.3						
Max Green Setting (Gmax), s	64.4		45.0		11.0	49.4						
Max Q Clear Time (g_c+l1), s	14.6		17.3		13.0	52.7						
Green Ext Time (p_c), s	9.3		1.4		0.0	0.0						

### Intersection Summary

HCM 6th Ctrl Delay 55.9

HCM 6th LOS E




### Notes

User approved volume balancing among the lanes for turning movement.



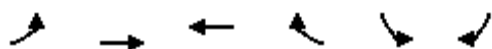
HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Cumulative AM Peak Hour

Intersection						
Int Delay, s/veh	154.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	120	520	50	50	470	120
Future Vol, veh/h	120	520	50	50	470	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	130	565	54	54	511	130
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1233	81	0	0	108	0
Stage 1	81	-	-	-	-	-
Stage 2	1152	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	197	985	-	-	1495	-
Stage 1	947	-	-	-	-	-
Stage 2	304	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 124	985	-	-	1495	-
Mov Cap-2 Maneuver	~ 124	-	-	-	-	-
Stage 1	947	-	-	-	-	-
Stage 2	192	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s\$	315.2	0		6.9		
HCM LOS	F					
Minor Lane/Major Mvmt		NBT	NBRWBLn1	SBL	SBT	
Capacity (veh/h)		-	-	428	1495	-
HCM Lane V/C Ratio		-	-	1.625	0.342	-
HCM Control Delay (s)		-	-\$	315.2	8.7	0
HCM Lane LOS		-	-	F	A	A
HCM 95th %tile Q(veh)		-	-	40	1.5	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

# HCM 6th Signalized Intersection Summary 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Cumulative AM Peak Hour



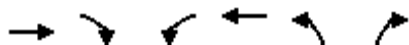
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰↰	↱↱	↰↰↰	↰	↰	↰↰
Traffic Volume (veh/h)	340	1470	940	100	480	910
Future Volume (veh/h)	340	1470	940	100	480	910
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1870	1870	1796	1796
Adj Flow Rate, veh/h	370	1598	1022	0	522	605
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	2	2	7	7
Cap, veh/h	419	1714	1675		789	1236
Arrive On Green	0.12	0.48	0.33	0.00	0.46	0.46
Sat Flow, veh/h	3483	3676	5274	1585	1711	2679
Grp Volume(v), veh/h	370	1598	1022	0	522	605
Grp Sat Flow(s),veh/h/ln	1742	1791	1702	1585	1711	1340
Q Serve(g_s), s	15.7	63.0	25.2	0.0	35.5	23.6
Cycle Q Clear(g_c), s	15.7	63.0	25.2	0.0	35.5	23.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	419	1714	1675		789	1236
V/C Ratio(X)	0.88	0.93	0.61		0.66	0.49
Avail Cap(c_a), veh/h	546	1898	1753		789	1236
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	64.9	36.8	42.3	0.0	31.3	28.1
Incr Delay (d2), s/veh	10.9	8.1	0.4	0.0	1.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	28.1	10.5	0.0	15.1	19.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	75.8	44.9	42.7	0.0	33.0	28.2
LnGrp LOS	E	D	D		C	C
Approach Vol, veh/h		1968	1022	A	1127	
Approach Delay, s/veh		50.7	42.7		30.4	
Approach LOS		D	D		C	
Timer - Assigned Phs				4	6	7
Phs Duration (G+Y+Rc), s				76.3	73.7	22.6
Change Period (Y+Rc), s				4.5	4.5	4.5
Max Green Setting (Gmax), s				79.5	61.5	23.5
Max Q Clear Time (g_c+I1), s				65.0	37.5	17.7
Green Ext Time (p_c), s				6.8	2.4	0.4
Intersection Summary						
HCM 6th Ctrl Delay			43.2			
HCM 6th LOS			D			

## Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Cumulative AM Peak Hour














Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑	↘↘	↗
Traffic Volume (veh/h)	1230	720	0	1660	150	30
Future Volume (veh/h)	1230	720	0	1660	150	30
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1337	583	0	1804	163	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	2085	930	0	2085	1244	570
Arrive On Green	0.59	0.59	0.00	0.59	0.36	0.36
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1337	583	0	1804	163	4
Grp Sat Flow(s),veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	37.4	36.1	0.0	63.9	4.8	0.2
Cycle Q Clear(g_c), s	37.4	36.1	0.0	63.9	4.8	0.2
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2085	930	0	2085	1244	570
V/C Ratio(X)	0.64	0.63	0.00	0.87	0.13	0.01
Avail Cap(c_a), veh/h	2748	1226	0	2748	1244	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	20.3	0.0	26.0	32.3	30.8
Incr Delay (d2), s/veh	0.3	0.7	0.0	2.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	13.4	0.0	25.7	2.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.9	21.0	0.0	28.5	32.5	30.8
LnGrp LOS	C	C	A	C	C	C
Approach Vol, veh/h	1920			1804	167	
Approach Delay, s/veh	20.9			28.5	32.4	
Approach LOS	C			C	C	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	58.0		92.0		92.0	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	25.5		115.5		115.5	
Max Q Clear Time (g_c+I1), s	6.8		39.4		65.9	
Green Ext Time (p_c), s	0.5		22.4		21.6	
Intersection Summary						
HCM 6th Ctrl Delay			24.9			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Cumulative AM Peak Hour










Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	60	60	20	50	20	30	450	20	20	300	160
Future Volume (veh/h)	270	60	60	20	50	20	30	450	20	20	300	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	293	65	65	22	54	22	33	489	22	22	326	174
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	262	450	382	72	170	69	93	890	397	72	849	379
Arrive On Green	0.15	0.24	0.24	0.04	0.13	0.12	0.05	0.25	0.25	0.04	0.24	0.24
Sat Flow, veh/h	1781	1870	1585	1781	1263	515	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	293	65	65	22	0	76	33	489	22	22	326	174
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1778	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.5	1.0	1.2	0.4	0.0	1.5	0.7	4.5	0.4	0.4	2.9	3.5
Cycle Q Clear(g_c), s	5.5	1.0	1.2	0.4	0.0	1.5	0.7	4.5	0.4	0.4	2.9	3.5
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	262	450	382	72	0	239	93	890	397	72	849	379
V/C Ratio(X)	1.12	0.14	0.17	0.30	0.00	0.32	0.36	0.55	0.06	0.30	0.38	0.46
Avail Cap(c_a), veh/h	262	925	784	262	0	879	262	1852	826	262	1852	826
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	11.2	11.2	17.4	0.0	14.7	17.1	12.2	10.7	17.4	11.9	12.2
Incr Delay (d2), s/veh	91.5	0.1	0.2	2.3	0.0	0.8	2.3	0.5	0.1	2.3	0.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	0.4	0.4	0.2	0.0	0.5	0.3	1.3	0.1	0.2	0.8	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	107.4	11.3	11.5	19.8	0.0	15.5	19.4	12.7	10.7	19.8	12.2	13.0
LnGrp LOS	F	B	B	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	423		98			544			522			
Approach Delay, s/veh	77.9		16.4			13.1			12.8			
Approach LOS	E		B			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.5	13.4	5.5	13.0	6.0	12.9	9.5	9.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+12.5), s	12.5	6.5	2.4	3.2	2.7	5.5	7.5	3.5				
Green Ext Time (p_c), s	0.0	2.4	0.0	0.4	0.0	2.0	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay			30.5									
HCM 6th LOS			C									

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Cumulative PM Peak Hour








												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	240	10	290	920	1150	0	0	790	580
Future Volume (veh/h)	0	0	0	240	10	290	920	1150	0	0	790	580
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	1885	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				261	11	256	1000	1250	0	0	859	630
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				1	1	1	1	1	0	0	1	1
Cap, veh/h				674	0	309	1091	2617	0	0	2462	605
Arrive On Green				0.19	0.19	0.19	0.31	0.73	0.00	0.00	0.38	0.38
Sat Flow, veh/h				3483	0	1598	3483	3676	0	0	6749	1595
Grp Volume(v), veh/h				261	0	256	1000	1250	0	0	859	630
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1742	1791	0	0	1621	1595
Q Serve(g_s), s				6.9	0.0	16.2	29.1	15.2	0.0	0.0	10.0	40.0
Cycle Q Clear(g_c), s				6.9	0.0	16.2	29.1	15.2	0.0	0.0	10.0	40.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				674	0	309	1091	2617	0	0	2462	605
V/C Ratio(X)				0.39	0.00	0.83	0.92	0.48	0.00	0.00	0.35	1.04
Avail Cap(c_a), veh/h				1421	0	652	1487	3025	0	0	2462	605
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				37.1	0.0	40.8	34.9	5.9	0.0	0.0	23.4	32.7
Incr Delay (d2), s/veh				0.1	0.0	2.2	6.2	0.1	0.0	0.0	0.0	47.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.8	0.0	6.3	12.5	4.2	0.0	0.0	3.6	22.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				37.2	0.0	43.0	41.1	5.9	0.0	0.0	23.4	80.2
LnGrp LOS				D	A	D	D	A	A	A	C	F
Approach Vol, veh/h					517			2250			1489	
Approach Delay, s/veh					40.1			21.5			47.4	
Approach LOS					D			C			D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		81.0			37.0	44.0		24.4				
Change Period (Y+Rc), s		5.3			4.0	5.3		5.3				
Max Green Setting (Gmax), s		87.7			45.0	38.7		41.7				
Max Q Clear Time (g_c+I1), s		17.2			31.1	42.0		18.2				
Green Ext Time (p_c), s		6.6			1.8	0.0		0.9				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				32.9								
HCM 6th LOS				C								

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	490	10	970	0	0	0	0	1580	320	290	740	0
Future Volume (veh/h)	490	10	970	0	0	0	0	1580	320	290	740	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	533	0	1061				0	1717	320	315	804	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1485	0	1321				0	1869	348	393	1725	0
Arrive On Green	0.41	0.00	0.41				0.00	0.34	0.32	0.11	0.48	0.00
Sat Flow, veh/h	3591	0	3195				0	5794	1030	3483	3676	0
Grp Volume(v), veh/h	533	0	1061				0	1510	527	315	804	0
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1621	1696	1742	1791	0
Q Serve(g_s), s	9.1	0.0	25.8				0.0	26.4	26.5	7.8	13.3	0.0
Cycle Q Clear(g_c), s	9.1	0.0	25.8				0.0	26.4	26.5	7.8	13.3	0.0
Prop In Lane	1.00		1.00				0.00		0.61	1.00		0.00
Lane Grp Cap(c), veh/h	1485	0	1321				0	1644	573	393	1725	0
V/C Ratio(X)	0.36	0.00	0.80				0.00	0.92	0.92	0.80	0.47	0.00
Avail Cap(c_a), veh/h	3444	0	3064				0	1646	574	511	1899	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.9	0.0	22.8				0.0	28.2	28.6	38.3	15.4	0.0
Incr Delay (d2), s/veh	0.1	0.0	1.2				0.0	8.5	19.6	5.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	8.8				0.0	10.6	13.0	3.4	4.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.0	0.0	24.0				0.0	36.6	48.1	43.5	15.4	0.0
LnGrp LOS	B	A	C				A	D	D	D	B	A
Approach Vol, veh/h	1594						2037			1119		
Approach Delay, s/veh	22.0						39.6			23.3		
Approach LOS	C						D			C		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	4.0	34.0	40.7		48.0							
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	3.0	28.7	84.5		* 47							
Max Q Clear Time (g_c+19, s)	19.8	28.5	27.8		15.3							
Green Ext Time (p_c), s	0.2	0.2	8.3		3.5							

### Intersection Summary

HCM 6th Ctrl Delay	29.9
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.















\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	 		 	
Traffic Volume (veh/h)	50	30	130	1010	120	210	460	700	1270	70	720	40
Future Volume (veh/h)	50	30	130	1010	120	210	460	700	1270	70	720	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	33	8	1098	130	177	500	761	598	76	783	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	76	18	1139	172	235	464	1756	1360	81	959	49
Arrive On Green	0.04	0.05	0.05	0.23	0.24	0.23	0.26	0.49	0.49	0.05	0.28	0.27
Sat Flow, veh/h	1781	1449	351	5023	718	977	1781	3554	2753	1781	3440	176
Grp Volume(v), veh/h	54	0	41	1098	0	307	500	761	598	76	404	419
Grp Sat Flow(s),veh/h/ln	1781	0	1800	1674	0	1695	1781	1777	1377	1781	1777	1839
Q Serve(g_s), s	2.7	0.0	2.0	19.1	0.0	14.9	23.0	12.2	12.4	3.8	18.7	18.8
Cycle Q Clear(g_c), s	2.7	0.0	2.0	19.1	0.0	14.9	23.0	12.2	12.4	3.8	18.7	18.8
Prop In Lane	1.00		0.20	1.00		0.58	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	69	0	95	1139	0	407	464	1756	1360	81	495	513
V/C Ratio(X)	0.78	0.00	0.43	0.96	0.00	0.75	1.08	0.43	0.44	0.94	0.82	0.82
Avail Cap(c_a), veh/h	202	0	673	1139	0	826	464	2699	2091	81	967	1000
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	0.0	40.6	33.8	0.0	31.3	32.6	14.4	14.4	42.0	29.7	29.8
Incr Delay (d2), s/veh	7.0	0.0	1.2	18.5	0.0	1.1	63.9	0.1	0.1	79.4	1.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.9	9.2	0.0	5.8	17.4	4.3	3.4	3.4	7.6	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.0	0.0	41.7	52.3	0.0	32.3	96.6	14.4	14.5	121.4	31.0	31.0
LnGrp LOS	D	A	D	D	A	C	F	B	B	F	C	C
Approach Vol, veh/h	95		1405			1859			899			
Approach Delay, s/veh	45.9		47.9			36.5			38.6			
Approach LOS	D		D			D			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	47.6	24.0	8.6	27.0	28.6	7.4	25.2				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	66.1	20.0	32.4	23.0	47.1	10.0	42.4				
Max Q Clear Time (g_c+15), s	4.0	14.4	21.1	4.0	25.0	20.8	4.7	16.9				
Green Ext Time (p_c), s	0.0	5.0	0.0	0.1	0.0	2.9	0.0	1.1				

### Intersection Summary

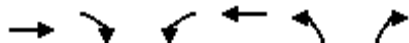
HCM 6th Ctrl Delay	41.0
HCM 6th LOS	D



# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Cumulative PM Peak Hour








Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	560	810	230	690	650	160
Future Volume (veh/h)	560	810	230	690	650	160
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	609	303	250	750	707	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	1097	485	431	990	911	418
Arrive On Green	0.31	0.31	0.13	0.54	0.27	0.27
Sat Flow, veh/h	3589	1547	3401	1841	3401	1560
Grp Volume(v), veh/h	609	303	250	750	707	38
Grp Sat Flow(s), veh/h/ln	1749	1547	1700	1841	1700	1560
Q Serve(g_s), s	6.0	6.9	2.9	13.1	7.9	0.8
Cycle Q Clear(g_c), s	6.0	6.9	2.9	13.1	7.9	0.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1097	485	431	990	911	418
V/C Ratio(X)	0.56	0.62	0.58	0.76	0.78	0.09
Avail Cap(c_a), veh/h	2975	1316	463	1995	1438	660
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	12.0	16.9	7.4	13.9	11.3
Incr Delay (d2), s/veh	0.2	0.5	1.6	0.5	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.6	1.7	1.0	2.3	2.5	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	11.9	12.5	18.5	7.9	14.5	11.3
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	912			1000	745	
Approach Delay, s/veh	12.1			10.5	14.3	
Approach LOS	B			B	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		15.0	9.2	16.9		26.1
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		17.4	5.1	34.4		44.0
Max Q Clear Time (g_c+I1), s		9.9	4.9	8.9		15.1
Green Ext Time (p_c), s		1.1	0.0	3.0		3.1
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			12.1			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	540	40	2370	0	0	0	0	1890	470	470	1030	0
Future Volume (veh/h)	540	40	2370	0	0	0	0	1890	470	470	1030	0
Initial Q (Qb), veh	0	0	20				0	20	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	587	43	2473				0	2054	485	511	1120	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1384	0	1448				0	2050	135	321	2809	0
Arrive On Green	0.40	0.40	0.40				0.00	0.42	0.41	0.09	0.55	0.00
Sat Flow, veh/h	3483	0	3643				0	4887	969	3483	5316	0
Grp Volume(v), veh/h	587	0	2473				0	1684	855	511	1120	0
Grp Sat Flow(s),veh/h/ln	1742	0	1214				0	1131	1708	1742	1716	0
Q Serve(g_s), s	17.2	0.0	56.0				0.0	59.0	59.0	13.0	17.8	0.0
Cycle Q Clear(g_c), s	17.2	0.0	56.0				0.0	59.0	59.0	13.0	17.8	0.0
Prop In Lane	1.00		1.00				0.00		0.57	1.00		0.00
Lane Grp Cap(c), veh/h	1384	0	1448				0	1421	765	321	2809	0
V/C Ratio(X)	0.42	0.00	1.71				0.00	1.19	1.12	1.59	0.40	0.00
Avail Cap(c_a), veh/h	1384	0	1448				0	1421	715	321	2809	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.8	0.0	42.4				0.0	40.9	41.0	63.9	18.6	0.0
Incr Delay (d2), s/veh	0.1	0.0	321.7				0.0	90.7	70.1	279.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	49.7				0.0	38.0	23.5	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.0	65.8				0.0	32.6	45.1	18.1	6.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	0.0	413.8				0.0	169.7	134.7	343.8	18.6	0.0
LnGrp LOS	C	A	F				A	F	F	F	B	A
Approach Vol, veh/h	3060						2539			1631		
Approach Delay, s/veh	340.4						157.9			120.5		
Approach LOS	F						F			F		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	7.9	63.0	60.0	80.9								
Change Period (Y+Rc), s	4.9	* 4.9	5.3	4.9								
Max Green Setting (Gmax), s	58.0	* 58	54.7	75.1								
Max Q Clear Time (g_c+I1), s	61.0	61.0	58.0	19.8								
Green Ext Time (p_c), s	0.0	0.0	0.0	5.5								

### Intersection Summary

HCM 6th Ctrl Delay	226.7
HCM 6th LOS	F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Contra Loma Plaza/Davison Drive

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	↰
Traffic Volume (veh/h)	70	60	80	180	40	150	80	960	160	220	1190	30
Future Volume (veh/h)	70	60	80	180	40	150	80	960	160	220	1190	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	76	65	5	196	43	17	87	1043	166	239	1293	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	119	101	189	266	279	236	113	1284	204	339	1607	40
Arrive On Green	0.12	0.12	0.12	0.15	0.15	0.15	0.06	0.42	0.41	0.10	0.45	0.44
Sat Flow, veh/h	989	846	1578	1795	1885	1594	1795	3089	491	3483	3571	88
Grp Volume(v), veh/h	141	0	5	196	43	17	87	604	605	239	648	677
Grp Sat Flow(s), veh/h/ln	1836	0	1578	1795	1885	1594	1795	1791	1789	1742	1791	1869
Q Serve(g_s), s	5.3	0.0	0.2	7.6	1.5	0.7	3.5	21.7	21.8	4.9	22.8	22.8
Cycle Q Clear(g_c), s	5.3	0.0	0.2	7.6	1.5	0.7	3.5	21.7	21.8	4.9	22.8	22.8
Prop In Lane	0.54		1.00	1.00		1.00	1.00		0.27	1.00		0.05
Lane Grp Cap(c), veh/h	220	0	189	266	279	236	113	744	744	339	806	841
V/C Ratio(X)	0.64	0.00	0.03	0.74	0.15	0.07	0.77	0.81	0.81	0.71	0.80	0.81
Avail Cap(c_a), veh/h	880	0	756	934	981	830	393	1839	1837	763	1839	1919
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	0.0	28.4	29.7	27.1	26.8	33.7	18.8	18.9	32.0	17.3	17.3
Incr Delay (d2), s/veh	1.2	0.0	0.0	1.5	0.1	0.0	4.1	0.8	0.8	1.0	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	0.1	3.1	0.6	0.2	1.5	7.7	7.8	2.0	8.6	9.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	0.0	28.4	31.2	27.2	26.8	37.8	19.6	19.8	33.0	18.0	18.0
LnGrp LOS	C	A	C	C	C	C	D	B	B	C	B	B
Approach Vol, veh/h	146			256			1296			1564		
Approach Delay, s/veh	31.7			30.3			20.9			20.3		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.1	34.3		12.8	8.6	36.9		14.8				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	60.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+10), s	23.8			7.3	5.5	24.8		9.6				
Green Ext Time (p_c), s	0.3	5.3		0.4	0.1	7.4		0.4				

### Intersection Summary











HCM 6th Ctrl Delay	21.9
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	220	110	80	130	740	140	840	70	1060	1320	230
Future Volume (veh/h)	170	220	110	80	130	740	140	840	70	1060	1320	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	185	239	74	87	141	804	152	913	73	1152	1435	185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	208	832	251	107	899	1290	135	1048	84	737	1575	865
Arrive On Green	0.12	0.31	0.30	0.06	0.25	0.25	0.08	0.31	0.30	0.21	0.44	0.43
Sat Flow, veh/h	1795	2710	819	1795	3582	2812	1795	3358	268	3483	3582	1577
Grp Volume(v), veh/h	185	156	157	87	141	804	152	487	499	1152	1435	185
Grp Sat Flow(s),veh/h/ln	1795	1791	1738	1795	1791	1406	1795	1791	1836	1742	1791	1577
Q Serve(g_s), s	14.9	9.7	10.1	7.0	4.5	31.7	11.0	37.6	37.6	31.0	54.8	5.4
Cycle Q Clear(g_c), s	14.9	9.7	10.1	7.0	4.5	31.7	11.0	37.6	37.6	31.0	54.8	5.4
Prop In Lane	1.00		0.47	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	208	550	534	107	899	1290	135	559	573	737	1575	865
V/C Ratio(X)	0.89	0.28	0.29	0.81	0.16	0.62	1.13	0.87	0.87	1.56	0.91	0.21
Avail Cap(c_a), veh/h	270	881	854	135	1492	1755	135	611	627	737	1712	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.8	38.5	38.8	68.0	42.8	30.1	67.7	47.6	47.7	57.7	38.3	7.5
Incr Delay (d2), s/veh	20.7	0.1	0.1	20.1	0.0	0.2	115.7	11.4	11.1	259.7	7.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	4.2	4.3	3.8	2.0	10.4	9.3	18.1	18.5	40.2	25.4	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.5	38.6	38.9	88.1	42.8	30.2	183.4	59.0	58.8	317.4	45.3	7.5
LnGrp LOS	F	D	D	F	D	C	F	E	E	F	D	A
Approach Vol, veh/h	498			1032			1138			2772		
Approach Delay, s/veh	55.7			36.8			75.5			155.9		
Approach LOS	E			D			E			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	35.0	49.7	12.8	49.0	16.3	68.4	21.0	40.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	31.0	48.7	11.0	71.4	11.0	* 69	22.0	60.4				
Max Q Clear Time (g_c+3.0), s	33.0	39.6	9.0	12.1	13.0	56.8	16.9	33.7				
Green Ext Time (p_c), s	0.0	2.6	0.0	1.0	0.0	6.3	0.1	2.4				

### Intersection Summary

HCM 6th Ctrl Delay 107.3

HCM 6th LOS F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	90	870	10	60	70	620	950	20	80	1140	200
Future Volume (veh/h)	170	90	870	10	60	70	620	950	20	80	1140	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	137	154	102	11	63	6	653	1000	10	84	1200	194
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	229	240	407	15	88	89	770	1921	836	108	1631	264
Arrive On Green	0.13	0.13	0.13	0.06	0.06	0.06	0.22	0.54	0.54	0.06	0.37	0.36
Sat Flow, veh/h	1795	1885	3195	278	1593	1598	3483	3582	1558	1795	4455	720
Grp Volume(v), veh/h	137	154	102	74	0	6	653	1000	10	84	924	470
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1871	0	1598	1742	1791	1558	1795	1716	1744
Q Serve(g_s), s	5.2	5.6	2.1	2.8	0.0	0.3	13.1	13.0	0.2	3.3	17.0	17.0
Cycle Q Clear(g_c), s	5.2	5.6	2.1	2.8	0.0	0.3	13.1	13.0	0.2	3.3	17.0	17.0
Prop In Lane	1.00		1.00	0.15		1.00	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	229	240	407	104	0	89	770	1921	836	108	1256	638
V/C Ratio(X)	0.60	0.64	0.25	0.71	0.00	0.07	0.85	0.52	0.01	0.77	0.74	0.74
Avail Cap(c_a), veh/h	544	571	968	1005	0	858	1199	2663	1158	222	1795	912
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	30.1	28.6	33.7	0.0	32.5	27.1	10.8	7.9	33.6	20.0	20.1
Incr Delay (d2), s/veh	0.9	1.1	0.1	3.4	0.0	0.1	2.1	0.1	0.0	4.4	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	2.4	0.7	1.3	0.0	0.1	5.1	4.0	0.1	1.5	6.3	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	31.2	28.7	37.1	0.0	32.6	29.2	10.9	7.9	38.0	20.4	20.9
LnGrp LOS	C	C	C	D	A	C	C	B	A	D	C	C
Approach Vol, veh/h	393			80			1663			1478		
Approach Delay, s/veh	30.4			36.8			18.1			21.6		
Approach LOS	C			D			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	43.0		13.3	20.1	31.3		8.0				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	9.0	52.7		21.1	25.0	* 37		39.0				
Max Q Clear Time (g_c+15), s	15.0	15.0		7.6	15.1	19.0		4.8				
Green Ext Time (p_c), s	0.0	4.7		0.7	1.0	6.7		0.2				

### Intersection Summary

HCM 6th Ctrl Delay	21.3
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱ ↱ ↱			↰ ↱ ↱ ↱			↰ ↱		↱	↰	↰	↱
Traffic Volume (veh/h)	110	1260	270	110	990	50	210	60	80	50	40	90
Future Volume (veh/h)	110	1260	270	110	990	50	210	60	80	50	40	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	120	1370	225	120	1076	21	228	65	-35	54	43	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	156	1884	309	177	2262	44	339	341	289	70	151	67
Arrive On Green	0.09	0.42	0.42	0.10	0.44	0.43	0.10	0.18	0.00	0.04	0.12	0.10
Sat Flow, veh/h	1795	4444	730	1795	5194	101	3483	1885	1598	1795	1235	546
Grp Volume(v), veh/h	120	1057	538	120	711	386	228	65	-35	54	0	62
Grp Sat Flow(s),veh/h/ln	1795	1716	1743	1795	1716	1864	1742	1885	1598	1795	0	1781
Q Serve(g_s), s	4.1	15.9	16.0	4.0	9.1	9.2	3.9	1.8	0.0	1.8	0.0	2.0
Cycle Q Clear(g_c), s	4.1	15.9	16.0	4.0	9.1	9.2	3.9	1.8	0.0	1.8	0.0	2.0
Prop In Lane	1.00		0.42	1.00		0.05	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	156	1454	739	177	1494	812	339	341	289	70	0	218
V/C Ratio(X)	0.77	0.73	0.73	0.68	0.48	0.48	0.67	0.19	-0.12	0.77	0.00	0.28
Avail Cap(c_a), veh/h	492	2930	1489	492	2930	1592	786	1367	1159	260	0	1148
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.7	14.9	14.9	27.0	12.5	12.5	27.0	21.6	0.0	29.5	0.0	24.9
Incr Delay (d2), s/veh	3.0	0.3	0.5	1.7	0.1	0.2	0.9	0.1	0.0	6.5	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	4.9	5.1	1.6	2.8	3.0	1.5	0.7	0.0	0.8	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	15.2	15.5	28.7	12.6	12.6	27.9	21.7	0.0	36.0	0.0	25.2
LnGrp LOS	C	B	B	C	B	B	C	C	A	D	A	C
Approach Vol, veh/h	1715			1217			258			116		
Approach Delay, s/veh	16.3			14.2			30.1			30.2		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.4	15.2	10.1	30.3	10.0	11.6	9.4	31.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	4.0	43.7	17.0	* 53	14.0	38.7	17.0	* 53				
Max Q Clear Time (g_c+13, s)	13.8	3.8	6.0	18.0	5.9	4.0	6.1	11.2				
Green Ext Time (p_c), s	0.0	0.2	0.1	8.1	0.2	0.2	0.1	4.7				

### Intersection Summary

HCM 6th Ctrl Delay 17.1  
HCM 6th LOS B

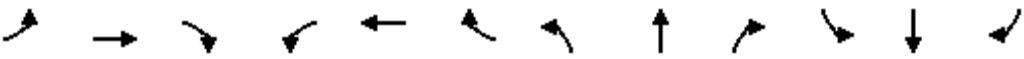
### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Cumulative PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↷	↷	↰	↷	↷	↰	↷	↷	↰	↷	↷
Traffic Volume (veh/h)	100	890	420	240	900	270	320	460	250	380	330	40
Future Volume (veh/h)	100	890	420	240	900	270	320	460	250	380	330	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	109	967	180	261	978	102	348	500	212	413	359	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	136	1272	236	294	1804	188	412	637	268	477	919	92
Arrive On Green	0.08	0.29	0.28	0.16	0.38	0.37	0.12	0.26	0.25	0.14	0.28	0.27
Sat Flow, veh/h	1810	4373	811	1810	4772	497	3510	2461	1037	3510	3313	330
Grp Volume(v), veh/h	109	764	383	261	708	372	348	366	346	413	195	200
Grp Sat Flow(s),veh/h/ln	1810	1729	1726	1810	1729	1811	1755	1805	1693	1755	1805	1838
Q Serve(g_s), s	6.2	21.2	21.3	14.9	16.9	17.0	10.2	19.9	20.1	12.1	9.2	9.3
Cycle Q Clear(g_c), s	6.2	21.2	21.3	14.9	16.9	17.0	10.2	19.9	20.1	12.1	9.2	9.3
Prop In Lane	1.00		0.47	1.00		0.27	1.00		0.61	1.00		0.18
Lane Grp Cap(c), veh/h	136	1006	502	294	1307	684	412	467	438	477	501	510
V/C Ratio(X)	0.80	0.76	0.76	0.89	0.54	0.54	0.84	0.78	0.79	0.87	0.39	0.39
Avail Cap(c_a), veh/h	189	1379	688	429	1839	963	467	703	659	533	737	750
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.9	34.0	34.3	43.2	25.6	25.8	45.5	36.3	36.8	44.6	30.8	31.0
Incr Delay (d2), s/veh	10.5	1.0	2.1	11.1	0.1	0.3	10.9	1.6	1.9	11.9	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	8.6	8.8	7.3	6.5	6.9	4.9	8.5	8.2	5.9	3.9	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.4	35.0	36.4	54.3	25.8	26.0	56.4	37.9	38.7	56.4	31.0	31.2
LnGrp LOS	E	C	D	D	C	C	E	D	D	E	C	C
Approach Vol, veh/h		1256			1341			1060			808	
Approach Delay, s/veh		37.4			31.4			44.2			44.0	
Approach LOS		D			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.3	31.3	21.1	34.7	16.4	33.2	11.9	43.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7				
Max Q Clear Time (g_c+I1), s	14.1	22.1	16.9	23.3	12.2	11.3	8.2	19.0				
Green Ext Time (p_c), s	0.2	2.4	0.2	4.5	0.1	1.3	0.0	4.6				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			38.4									
HCM 6th LOS			D									



# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱ ↲ ↳			↰ ↱ ↲ ↳	↰ ↱ ↲ ↳		↰ ↱ ↲ ↳	↰ ↱ ↲ ↳		↰ ↱ ↲ ↳	↰ ↱ ↲ ↳	↰ ↱ ↲ ↳
Traffic Volume (veh/h)	330	1400	170	220	1200	320	270	410	320	510	340	140
Future Volume (veh/h)	330	1400	170	220	1200	320	270	410	320	510	340	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	359	1522	120	239	1304	143	293	446	233	554	370	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	288	1816	143	197	1661	508	228	579	300	442	912	399
Arrive On Green	0.16	0.37	0.36	0.11	0.32	0.32	0.13	0.25	0.24	0.13	0.25	0.25
Sat Flow, veh/h	1795	4863	383	1795	5147	1574	1795	2276	1179	3483	3582	1566
Grp Volume(v), veh/h	359	1074	568	239	1304	143	293	350	329	554	370	28
Grp Sat Flow(s),veh/h/ln	1795	1716	1815	1795	1716	1574	1795	1791	1664	1742	1791	1566
Q Serve(g_s), s	19.0	33.8	33.8	13.0	27.2	8.0	15.0	21.4	21.8	15.0	10.2	1.6
Cycle Q Clear(g_c), s	19.0	33.8	33.8	13.0	27.2	8.0	15.0	21.4	21.8	15.0	10.2	1.6
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.71	1.00		1.00
Lane Grp Cap(c), veh/h	288	1281	678	197	1661	508	228	456	424	442	912	399
V/C Ratio(X)	1.24	0.84	0.84	1.21	0.79	0.28	1.29	0.77	0.78	1.25	0.41	0.07
Avail Cap(c_a), veh/h	288	1624	859	197	2176	666	228	681	633	442	1363	596
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.6	33.8	33.9	52.6	36.3	29.8	51.6	40.9	41.4	51.6	36.6	33.5
Incr Delay (d2), s/veh	135.9	2.6	4.9	132.5	1.0	0.1	158.0	1.4	1.7	131.8	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	13.8	15.1	13.0	11.0	3.0	16.5	9.3	8.9	14.4	4.3	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	185.5	36.4	38.8	185.2	37.4	29.9	209.7	42.2	43.1	183.5	36.8	33.5
LnGrp LOS	F	D	D	F	D	C	F	D	D	F	D	C
Approach Vol, veh/h	2001				1686				972		952	
Approach Delay, s/veh	63.8				57.7				93.0		122.0	
Approach LOS	E				E				F		F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	49.0	34.1	17.0	48.2	19.0	34.1	23.0	42.2				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	45.0	43.7	13.0	54.7	15.0	43.7	19.0	48.7				
Max Q Clear Time (g_c+I1), s	117.0	23.8	15.0	35.8	17.0	12.2	21.0	29.2				
Green Ext Time (p_c), s	0.0	2.4	0.0	7.1	0.0	1.5	0.0	6.1				

### Intersection Summary

HCM 6th Ctrl Delay	76.9
HCM 6th LOS	E

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	2600	1200	430	1910	0	0	0	0	880	10	850
Future Volume (veh/h)	0	2600	1200	430	1910	0	0	0	0	880	10	850
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	2737	942	453	2011	0				934	0	858
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2559	781	358	3631	0				893	0	397
Arrive On Green	0.00	0.49	0.49	0.18	0.70	0.00				0.25	0.00	0.25
Sat Flow, veh/h	0	5358	1582	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	2737	942	453	2011	0				934	0	858
Grp Sat Flow(s),veh/h/ln	0	1729	1582	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	74.0	74.0	27.0	28.5	0.0				37.0	0.0	37.0
Cycle Q Clear(g_c), s	0.0	74.0	74.0	27.0	28.5	0.0				37.0	0.0	37.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2559	781	358	3631	0				893	0	397
V/C Ratio(X)	0.00	1.07	1.21	1.26	0.55	0.00				1.05	0.00	2.16
Avail Cap(c_a), veh/h	0	2559	781	358	3631	0				893	0	397
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	38.0	38.0	61.5	11.0	0.0				56.5	0.0	56.5
Incr Delay (d2), s/veh	0.0	39.8	105.0	139.5	0.1	0.0				42.9	0.0	530.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	39.0	49.8	13.6	9.8	0.0				21.8	0.0	73.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	77.8	143.0	201.0	11.1	0.0				99.4	0.0	586.9
LnGrp LOS	A	F	F	F	B	A				F	A	F
Approach Vol, veh/h		3679			2464						1792	
Approach Delay, s/veh		94.5			46.0						332.8	
Approach LOS		F			D						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	31.0	78.0		41.0		109.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	72.7			35.7		103.7						
Max Q Clear Time (g_c+29.0), s	76.0			39.0		30.5						
Green Ext Time (p_c), s	0.0	0.0		0.0		14.7						

### Intersection Summary

HCM 6th Ctrl Delay 133.3  
HCM 6th LOS F

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↑	↑	↑↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	2780	700	210	1330	730	1010	50	420	0	0	0
Future Volume (veh/h)	0	2780	700	210	1330	730	1010	50	420	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	0	2926	549	221	1400	456	1101	0	305			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	1	1	1	1	1	1	1	1			
Cap, veh/h	0	2280	696	182	2992	903	1238	0	551			
Arrive On Green	0.00	0.44	0.44	0.10	0.58	0.58	0.34	0.00	0.34			
Sat Flow, veh/h	0	5316	1572	1795	5147	1553	3591	0	1598			
Grp Volume(v), veh/h	0	2926	549	221	1400	456	1101	0	305			
Grp Sat Flow(s),veh/h/ln	0	1716	1572	1795	1716	1553	1795	0	1598			
Q Serve(g_s), s	0.0	48.0	32.4	11.0	16.9	18.9	31.4	0.0	16.8			
Cycle Q Clear(g_c), s	0.0	48.0	32.4	11.0	16.9	18.9	31.4	0.0	16.8			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2280	696	182	2992	903	1238	0	551			
V/C Ratio(X)	0.00	1.28	0.79	1.21	0.47	0.51	0.89	0.00	0.55			
Avail Cap(c_a), veh/h	0	2280	696	182	2992	903	1624	0	723			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	30.2	25.8	48.7	13.0	13.4	33.5	0.0	28.8			
Incr Delay (d2), s/veh	0.0	131.0	5.6	135.4	0.0	0.2	4.4	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	45.7	12.2	11.6	5.8	5.9	13.6	0.0	6.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	161.2	31.4	184.1	13.1	13.6	37.9	0.0	29.1			
LnGrp LOS	A	F	C	F	B	B	D	A	C			
Approach Vol, veh/h	3475					2077		1406				
Approach Delay, s/veh	140.7					31.4		36.0				
Approach LOS	F					C		D				
Timer - Assigned Phs	1	2	4			6						
Phs Duration (G+Y+Rc), s	5.0	52.0	41.3			67.0						
Change Period (Y+Rc), s	4.0	5.3	5.3			5.3						
Max Green Setting (Gmax), s	1.0	46.7	47.7			61.7						
Max Q Clear Time (g_c+11.3), s	1.0	50.0	33.4			20.9						
Green Ext Time (p_c), s	0.0	0.0	2.7			8.9						

### Intersection Summary

HCM 6th Ctrl Delay 86.9

HCM 6th LOS F

### Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road

The Ranch  
Cumulative PM Peak Hour











Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	160	0	10	50	170	10	70	20	440	420	170
Future Volume (veh/h)	110	160	0	10	50	170	10	70	20	440	420	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	120	174	0	11	54	75	11	76	2	478	457	151
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	195	255	0	157	81	113	157	435	11	550	902	296
Arrive On Green	0.11	0.14	0.00	0.09	0.11	0.11	0.09	0.12	0.09	0.31	0.34	0.31
Sat Flow, veh/h	1795	1885	0	1795	714	992	1795	3566	93	1795	2649	868
Grp Volume(v), veh/h	120	174	0	11	0	129	11	38	40	478	308	300
Grp Sat Flow(s),veh/h/ln	1795	1885	0	1795	0	1707	1795	1791	1868	1795	1791	1726
Q Serve(g_s), s	2.9	4.0	0.0	0.3	0.0	3.3	0.3	0.9	0.9	11.5	6.3	6.4
Cycle Q Clear(g_c), s	2.9	4.0	0.0	0.3	0.0	3.3	0.3	0.9	0.9	11.5	6.3	6.4
Prop In Lane	1.00		0.00	1.00		0.58	1.00		0.05	1.00		0.50
Lane Grp Cap(c), veh/h	195	255	0	157	0	194	157	218	228	550	610	588
V/C Ratio(X)	0.61	0.68	0.00	0.07	0.00	0.66	0.07	0.17	0.18	0.87	0.50	0.51
Avail Cap(c_a), veh/h	431	1482	0	431	0	1342	823	1994	2081	823	1994	1922
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.5	18.9	0.0	19.2	0.0	19.5	19.2	18.0	18.1	15.0	12.0	12.3
Incr Delay (d2), s/veh	1.2	1.2	0.0	0.1	0.0	1.5	0.1	0.1	0.1	4.6	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.5	0.0	0.1	0.0	1.2	0.1	0.3	0.3	4.1	1.8	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.7	20.1	0.0	19.3	0.0	20.9	19.3	18.2	18.2	19.6	12.3	12.6
LnGrp LOS	C	C	A	B	A	C	B	B	B	B	B	B
Approach Vol, veh/h												
294												
140												
89												
1086												
Approach Delay, s/veh												
20.3												
20.8												
18.3												
15.6												
Approach LOS												
C												
C												
B												
B												
Timer - Assigned Phs												
1												
2												
3												
4												
5												
6												
7												
8												
Phs Duration (G+Y+Rc), s												
8.0												
9.6												
8.0												
10.2												
8.0												
19.6												
9.0												
9.2												
Change Period (Y+Rc), s												
4.0												
5.3												
4.0												
4.0												
5.3												
4.0												
4.0												
Max Green Setting (Gmax), s												
49.7												
49.7												
11.0												
36.0												
21.0												
49.7												
11.0												
36.0												
Max Q Clear Time (g_c+I1), s												
2.9												
2.9												
2.3												
6.0												
2.3												
8.4												
4.9												
5.3												
Green Ext Time (p_c), s												
0.5												
0.2												
0.0												
0.5												
0.0												
2.2												
0.1												
0.4												
Intersection Summary												
HCM 6th Ctrl Delay												
17.1												
HCM 6th LOS												
B												

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	150	80	60	120	100	180	540	160	310	460	110
Future Volume (veh/h)	100	150	80	60	120	100	180	540	160	310	460	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	109	163	69	65	130	77	196	587	148	337	500	102
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	141	233	99	83	169	100	246	816	205	391	1092	222
Arrive On Green	0.08	0.18	0.18	0.05	0.15	0.15	0.14	0.29	0.26	0.22	0.37	0.34
Sat Flow, veh/h	1810	1267	536	1810	1118	662	1810	2857	719	1810	2989	607
Grp Volume(v), veh/h	109	0	232	65	0	207	196	370	365	337	301	301
Grp Sat Flow(s),veh/h/ln	1810	0	1803	1810	0	1781	1810	1805	1771	1810	1805	1791
Q Serve(g_s), s	3.5	0.0	7.2	2.1	0.0	6.6	6.2	11.0	11.1	10.7	7.6	7.7
Cycle Q Clear(g_c), s	3.5	0.0	7.2	2.1	0.0	6.6	6.2	11.0	11.1	10.7	7.6	7.7
Prop In Lane	1.00		0.30	1.00		0.37	1.00		0.41	1.00		0.34
Lane Grp Cap(c), veh/h	141	0	331	83	0	270	246	515	506	391	660	654
V/C Ratio(X)	0.77	0.00	0.70	0.78	0.00	0.77	0.80	0.72	0.72	0.86	0.46	0.46
Avail Cap(c_a), veh/h	335	0	1122	304	0	1078	578	1214	1191	517	1153	1144
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	22.7	28.1	0.0	24.2	24.9	19.1	19.4	22.5	14.4	14.6
Incr Delay (d2), s/veh	3.3	0.0	1.0	6.0	0.0	1.7	2.2	0.7	0.7	9.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	2.7	1.0	0.0	2.6	2.5	3.9	3.9	4.9	2.5	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.2	0.0	23.8	34.0	0.0	26.0	27.1	19.8	20.1	31.5	14.6	14.8
LnGrp LOS	C	A	C	C	A	C	C	B	C	C	B	B
Approach Vol, veh/h	341					272		931		939		
Approach Delay, s/veh	25.8					27.9		21.5		20.7		
Approach LOS	C					C		C		C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.8	21.0	6.7	14.9	12.1	25.7	8.6	13.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	38.7	10.0	37.0	19.0	36.7	11.0	36.0					
Max Q Clear Time (g_c+I12, s)	13.1	4.1	9.2	8.2	9.7	5.5	8.6					
Green Ext Time (p_c), s	0.2	2.6	0.0	0.8	0.2	2.1	0.1	0.7				

### Intersection Summary

HCM 6th Ctrl Delay	22.5
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Cumulative PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	160	330	690	40	100	560
Future Volume (veh/h)	160	330	690	40	100	560
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	174	57	750	17	109	609
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	259	231	1373	599	144	2137
Arrive On Green	0.14	0.14	0.38	0.38	0.08	0.59
Sat Flow, veh/h	1810	1610	3705	1574	1810	3705
Grp Volume(v), veh/h	174	57	750	17	109	609
Grp Sat Flow(s), veh/h/ln	1810	1610	1805	1574	1810	1805
Q Serve(g_s), s	2.8	1.0	4.9	0.2	1.8	2.5
Cycle Q Clear(g_c), s	2.8	1.0	4.9	0.2	1.8	2.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	259	231	1373	599	144	2137
V/C Ratio(X)	0.67	0.25	0.55	0.03	0.76	0.28
Avail Cap(c_a), veh/h	2036	1811	4897	2136	1976	9316
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.3	11.5	7.3	5.9	13.6	3.0
Incr Delay (d2), s/veh	1.1	0.2	0.1	0.0	3.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.2	0.8	0.0	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.4	11.7	7.4	5.9	16.7	3.1
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	231		767			718
Approach Delay, s/veh	13.0		7.4			5.1
Approach LOS	B		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	6.4	15.5			21.9	8.3
Change Period (Y+Rc), s	4.0	5.3			5.3	4.0
Max Green Setting (Gmax), s	39.7				76.7	34.0
Max Q Clear Time (g_c+I), s	6.9				4.5	4.8
Green Ext Time (p_c), s	0.1	3.2			2.5	0.3
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			7.2			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	0	0	0	130	80	410	0	590	80	370	350	0
Future Volume (veh/h)	0	0	0	130	80	410	0	590	80	370	350	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	0	0	0	137	84	115	0	621	77	389	368	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	276	0	473	263	234	5	1062	131	620	2244	0
Arrive On Green	0.00	0.00	0.00	0.15	0.15	0.15	0.00	0.33	0.29	0.18	0.62	0.00
Sat Flow, veh/h	0	1900	0	1810	1805	1610	1810	3233	400	3510	3705	0
Grp Volume(v), veh/h	0	0	0	137	84	115	0	346	352	389	368	0
Grp Sat Flow(s), veh/h/ln	0	1900	0	1810	1805	1610	1810	1805	1828	1755	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	2.4	1.4	2.3	0.0	5.5	5.5	3.5	1.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.4	1.4	2.3	0.0	5.5	5.5	3.5	1.5	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.22	1.00		0.00
Lane Grp Cap(c), veh/h	0	276	0	473	263	234	5	593	601	620	2244	0
V/C Ratio(X)	0.00	0.00	0.00	0.29	0.32	0.49	0.00	0.58	0.59	0.63	0.16	0.00
Avail Cap(c_a), veh/h	0	3982	0	4002	3783	3374	632	2207	2235	2452	5674	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	13.6	13.2	13.5	0.0	9.6	9.7	13.1	2.7	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.3	0.6	0.0	0.3	0.3	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.7	0.4	0.6	0.0	1.3	1.3	1.1	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	13.7	13.4	14.1	0.0	9.9	10.1	13.5	2.7	0.0
LnGrp LOS	A	A	A	B	B	B	A	A	B	B	A	A
Approach Vol, veh/h	0			336			698			757		
Approach Delay, s/veh	0.0			13.8			10.0			8.3		
Approach LOS				B			A			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.3			9.0	0.0	25.4		9.0				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	40.7			72.0	12.0	52.7		72.0				
Max Q Clear Time (g_c+15), s	7.5			0.0	0.0	3.5		4.4				
Green Ext Time (p_c), s	0.7	2.5		0.0	0.0	1.7		0.8				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	10.0											
HCM 6th LOS	A											











# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	610	100	280	550	190	80	140	210	120	170	140
Future Volume (veh/h)	180	610	100	280	550	190	80	140	210	120	170	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	189	642	89	295	579	158	84	147	88	126	179	53
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	229	787	109	300	803	219	106	770	436	124	986	284
Arrive On Green	0.13	0.25	0.25	0.17	0.29	0.29	0.06	0.35	0.35	0.07	0.36	0.36
Sat Flow, veh/h	1781	3135	434	1781	2761	751	1781	2188	1237	1781	2723	783
Grp Volume(v), veh/h	189	363	368	295	372	365	84	118	117	126	115	117
Grp Sat Flow(s),veh/h/ln	1781	1777	1792	1781	1777	1735	1781	1777	1648	1781	1777	1729
Q Serve(g_s), s	10.4	19.4	19.5	16.6	18.9	19.1	4.7	4.6	5.0	7.0	4.4	4.7
Cycle Q Clear(g_c), s	10.4	19.4	19.5	16.6	18.9	19.1	4.7	4.6	5.0	7.0	4.4	4.7
Prop In Lane	1.00		0.24	1.00		0.43	1.00		0.75	1.00		0.45
Lane Grp Cap(c), veh/h	229	446	450	300	517	505	106	626	580	124	643	626
V/C Ratio(X)	0.82	0.81	0.82	0.98	0.72	0.72	0.79	0.19	0.20	1.02	0.18	0.19
Avail Cap(c_a), veh/h	277	608	613	300	631	616	106	626	580	124	643	626
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	35.5	35.6	41.8	32.1	32.2	46.8	22.7	22.9	46.9	21.9	22.1
Incr Delay (d2), s/veh	15.3	6.1	6.2	46.9	3.1	3.3	32.4	0.7	0.8	86.0	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	8.7	8.8	10.9	8.1	8.0	3.0	2.0	2.0	5.9	1.9	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.1	41.6	41.8	88.6	35.2	35.5	79.2	23.3	23.7	132.9	22.5	22.7
LnGrp LOS	E	D	D	F	D	D	E	C	C	F	C	C
Approach Vol, veh/h	920			1032			319			358		
Approach Delay, s/veh	45.1			50.6			38.2			61.5		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	1.0	39.5	21.0	29.3	10.0	40.5	17.0	33.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.5	35.0	16.5	34.0	5.5	36.0	15.2	35.3				
Max Q Clear Time (g_c+19, s)	19.0	7.0	18.6	21.5	6.7	6.7	12.4	21.1				
Green Ext Time (p_c), s	0.0	1.2	0.0	3.3	0.0	1.2	0.1	3.6				

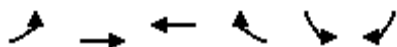
### Intersection Summary

HCM 6th Ctrl Delay	48.6
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

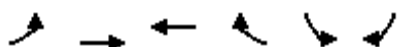
The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	870	990	880	310	30
Future Volume (veh/h)	70	870	990	880	310	30
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	74	916	1042	469	326	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	112	2007	1573	702	1096	503
Arrive On Green	0.06	0.56	0.44	0.44	0.32	0.32
Sat Flow, veh/h	1781	3647	3647	1585	3456	1585
Grp Volume(v), veh/h	74	916	1042	469	326	1
Grp Sat Flow(s), veh/h/ln	1781	1777	1777	1585	1728	1585
Q Serve(g_s), s	2.8	10.2	15.7	15.9	4.8	0.0
Cycle Q Clear(g_c), s	2.8	10.2	15.7	15.9	4.8	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	112	2007	1573	702	1096	503
V/C Ratio(X)	0.66	0.46	0.66	0.67	0.30	0.00
Avail Cap(c_a), veh/h	355	4746	3828	1708	1096	503
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	8.7	14.9	14.9	17.4	15.8
Incr Delay (d2), s/veh	6.5	0.2	0.5	1.1	0.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.9	5.2	4.8	1.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.5	8.8	15.4	16.0	18.1	15.8
LnGrp LOS	D	A	B	B	B	B
Approach Vol, veh/h		990	1511		327	
Approach Delay, s/veh		11.0	15.6		18.1	
Approach LOS		B	B		B	
Timer - Assigned Phs			4		6	7 8
Phs Duration (G+Y+Rc), s			42.3		25.5	8.3 34.0
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			90.0		21.0	13.0 72.5
Max Q Clear Time (g_c+I1), s			12.2		6.8	4.8 17.9
Green Ext Time (p_c), s			7.2		0.9	0.1 11.6
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			14.3			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Cumulative PM Peak Hour










Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	510	980	840	280	1560	620
Future Volume (veh/h)	510	980	840	280	1560	620
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	554	1065	913	112	1696	460
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	454	2954	1046	467	1310	601
Arrive On Green	0.25	0.57	0.29	0.29	0.37	0.37
Sat Flow, veh/h	1810	5358	3705	1610	3510	1610
Grp Volume(v), veh/h	554	1065	913	112	1696	460
Grp Sat Flow(s), veh/h/ln	1810	1729	1805	1610	1755	1610
Q Serve(g_s), s	35.0	15.5	33.5	7.4	52.0	34.9
Cycle Q Clear(g_c), s	35.0	15.5	33.5	7.4	52.0	34.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	454	2954	1046	467	1310	601
V/C Ratio(X)	1.22	0.36	0.87	0.24	1.29	0.77
Avail Cap(c_a), veh/h	454	3349	1321	589	1310	601
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.2	16.3	47.1	37.8	43.7	38.3
Incr Delay (d2), s/veh	117.2	0.0	4.7	0.1	138.5	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.2	5.9	15.3	2.9	46.8	14.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	169.4	16.3	51.8	37.9	182.2	43.7
LnGrp LOS	F	B	D	D	F	D
Approach Vol, veh/h		1619	1025		2156	
Approach Delay, s/veh		68.7	50.3		152.7	
Approach LOS		E	D		F	
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		83.4			39.0	44.4
Change Period (Y+Rc), s		5.3			4.5	5.3
Max Green Setting (Gmax), s		88.7			34.5	49.7
Max Q Clear Time (g_c+I1), s		17.5			37.0	35.5
Green Ext Time (p_c), s		5.1			0.0	3.6
					0.0	
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			102.5			
HCM 6th LOS			F			

# HCM 6th Signalized Intersection Summary 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	770	1770	0	0	470	1120	650	0	410	0	0	0
Future Volume (veh/h)	770	1770	0	0	470	1120	650	0	410	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	811	1863	0	0	495	784	684	0	397			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	904	3220	0	0	606	1027	1052	0	468			
Arrive On Green	0.26	0.62	0.00	0.00	0.32	0.32	0.29	0.00	0.29			
Sat Flow, veh/h	3510	5358	0	0	1900	3220	3619	0	1610			
Grp Volume(v), veh/h	811	1863	0	0	495	784	684	0	397			
Grp Sat Flow(s),veh/h/ln	1755	1729	0	0	1900	1610	1810	0	1610			
Q Serve(g_s), s	20.1	19.2	0.0	0.0	21.7	19.8	14.9	0.0	21.0			
Cycle Q Clear(g_c), s	20.1	19.2	0.0	0.0	21.7	19.8	14.9	0.0	21.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	904	3220	0	0	606	1027	1052	0	468			
V/C Ratio(X)	0.90	0.58	0.00	0.00	0.82	0.76	0.65	0.00	0.85			
Avail Cap(c_a), veh/h	1127	5497	0	0	1319	2236	1856	0	826			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	32.4	10.1	0.0	0.0	28.3	27.7	28.0	0.0	30.2			
Incr Delay (d2), s/veh	7.2	0.1	0.0	0.0	1.1	0.5	0.3	0.0	1.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.9	5.8	0.0	0.0	9.2	7.1	6.0	0.0	17.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.6	10.2	0.0	0.0	29.4	28.1	28.3	0.0	31.8			
LnGrp LOS	D	B	A	A	C	C	C	A	C			
Approach Vol, veh/h	2674			1279			1081					
Approach Delay, s/veh	19.1			28.6			29.6					
Approach LOS	B			C			C					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	60.0			30.2		27.3	32.8					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	94.4			45.0		29.0	61.4					
Max Q Clear Time (g_c+I1), s	21.2			23.0		22.1	23.7					
Green Ext Time (p_c), s	12.6			2.0		1.1	3.8					

## Intersection Summary




HCM 6th Ctrl Delay 23.8  
HCM 6th LOS C

## Notes

User approved volume balancing among the lanes for turning movement.

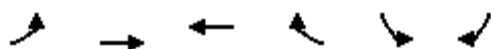
HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Cumulative PM Peak Hour

Intersection						
Int Delay, s/veh	98.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	580	110	120	410	100
Future Vol, veh/h	80	580	110	120	410	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	87	630	120	130	446	109
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1186	185	0	0	250	0
Stage 1	185	-	-	-	-	-
Stage 2	1001	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	210	862	-	-	1327	-
Stage 1	852	-	-	-	-	-
Stage 2	358	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	135	862	-	-	1327	-
Mov Cap-2 Maneuver	135	-	-	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	230	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	202.7	0	7.3			
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	522	1327	-	
HCM Lane V/C Ratio	-	-	1.374	0.336	-	
HCM Control Delay (s)	-	-	202.7	9.1	0	
HCM Lane LOS	-	-	F	A	A	
HCM 95th %tile Q(veh)	-	-	32.7	1.5	-	

# HCM 6th Signalized Intersection Summary 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Cumulative PM Peak Hour



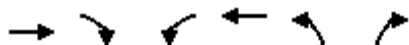
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↱↱	↰	↰	↰↰	
Traffic Volume (veh/h)	200	1640	1260	140	700	710	
Future Volume (veh/h)	200	1640	1260	140	700	710	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	217	1783	1370	0	761	768	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	290	1740	1318		785	1464	
Arrive On Green	0.08	0.49	0.37	0.00	0.44	0.44	
Sat Flow, veh/h	3456	3647	3647	1585	1781	2790	
Grp Volume(v), veh/h	217	1783	1370	0	761	768	
Grp Sat Flow(s),veh/h/ln	1728	1777	1777	1585	1781	1395	
Q Serve(g_s), s	7.1	56.3	42.7	0.0	48.0	20.8	
Cycle Q Clear(g_c), s	7.1	56.3	42.7	0.0	48.0	20.8	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	290	1740	1318		785	1464	
V/C Ratio(X)	0.75	1.02	1.04		0.97	0.52	
Avail Cap(c_a), veh/h	361	1740	1318		785	1464	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	51.5	29.3	36.2	0.0	31.4	17.9	
Incr Delay (d2), s/veh	4.8	28.1	35.6	0.0	24.5	0.2	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.2	28.5	23.8	0.0	25.2	18.1	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	56.2	57.5	71.8	0.0	55.9	18.1	
LnGrp LOS	E	F	F		E	B	
Approach Vol, veh/h		2000	1370	A	1529		
Approach Delay, s/veh		57.4	71.8		36.9		
Approach LOS		E	E		D		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				60.3	54.7	13.6	46.7
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				55.8	50.2	11.5	39.8
Max Q Clear Time (g_c+I1), s				58.3	50.0	9.1	44.7
Green Ext Time (p_c), s				0.0	0.1	0.1	0.0
Intersection Summary							
HCM 6th Ctrl Delay			55.0				
HCM 6th LOS			E				

## Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Cumulative PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	1730	610	0	1710	320	80
Future Volume (veh/h)	1730	610	0	1710	320	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1880	472	0	1859	348	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	2263	1009	0	2263	1015	465
Arrive On Green	0.64	0.64	0.00	0.64	0.29	0.29
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1880	472	0	1859	348	59
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	46.9	17.7	0.0	45.8	9.1	3.1
Cycle Q Clear(g_c), s	46.9	17.7	0.0	45.8	9.1	3.1
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2263	1009	0	2263	1015	465
V/C Ratio(X)	0.83	0.47	0.00	0.82	0.34	0.13
Avail Cap(c_a), veh/h	2565	1144	0	2565	1015	465
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	10.8	0.0	15.9	31.9	29.8
Incr Delay (d2), s/veh	2.2	0.3	0.0	2.0	0.9	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	6.0	0.0	16.3	3.9	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.3	11.1	0.0	17.9	32.8	30.4
LnGrp LOS	B	B	A	B	C	C
Approach Vol, veh/h	2352			1859	407	
Approach Delay, s/veh	16.9			17.9	32.5	
Approach LOS	B			B	C	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	37.8			77.2		77.2
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	23.5			82.5		82.5
Max Q Clear Time (g_c+I1), s	11.1			48.9		47.8
Green Ext Time (p_c), s	1.2			23.8		19.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			18.7			
HCM 6th LOS			B			














# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Cumulative PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	40	200	20	30	10	20	510	20	20	600	160
Future Volume (veh/h)	190	40	200	20	30	10	20	510	20	20	600	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	202	43	213	21	32	11	21	543	21	21	638	170
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	242	430	364	68	176	61	68	1060	473	68	1060	473
Arrive On Green	0.14	0.23	0.23	0.04	0.13	0.12	0.04	0.30	0.30	0.04	0.30	0.30
Sat Flow, veh/h	1781	1870	1585	1781	1331	457	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	202	43	213	21	0	43	21	543	21	21	638	170
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1788	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.5	0.7	4.8	0.5	0.0	0.9	0.5	5.1	0.4	0.5	6.2	3.4
Cycle Q Clear(g_c), s	4.5	0.7	4.8	0.5	0.0	0.9	0.5	5.1	0.4	0.5	6.2	3.4
Prop In Lane	1.00		1.00	1.00		0.26	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	242	430	364	68	0	237	68	1060	473	68	1060	473
V/C Ratio(X)	0.83	0.10	0.58	0.31	0.00	0.18	0.31	0.51	0.04	0.31	0.60	0.36
Avail Cap(c_a), veh/h	242	854	724	242	0	817	242	1711	763	242	1711	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.1	12.3	13.9	18.9	0.0	15.7	18.9	11.8	10.1	18.9	12.2	11.2
Incr Delay (d2), s/veh	21.6	0.1	1.5	2.5	0.0	0.4	2.5	0.4	0.0	2.5	0.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.3	1.6	0.2	0.0	0.3	0.2	1.5	0.1	0.2	1.8	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.7	12.4	15.4	21.5	0.0	16.0	21.5	12.2	10.1	21.5	12.7	11.6
LnGrp LOS	D	B	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	458			64			585			829		
Approach Delay, s/veh	25.4			17.8			12.4			12.7		
Approach LOS	C			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.6	16.1	5.6	13.3	5.6	16.1	9.5	9.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	19.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+12.5), s	7.1	7.1	2.5	6.8	2.5	8.2	6.5	2.9				
Green Ext Time (p_c), s	0.0	2.6	0.0	0.7	0.0	3.4	0.0	0.1				



















### Intersection Summary

HCM 6th Ctrl Delay	15.8
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)










The Ranch  
Cumulative Plus Project AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	370	10	450	1160	955	0	0	801	530
Future Volume (veh/h)	0	0	0	370	10	450	1160	955	0	0	801	530
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	1885	1885	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				402	11	390	1261	1038	0	0	871	230
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				1	1	1	2	2	0	0	2	2
Cap, veh/h				972	0	446	1349	2279	0	0	1359	333
Arrive On Green				0.28	0.28	0.28	0.39	0.64	0.00	0.00	0.21	0.21
Sat Flow, veh/h				3483	0	1598	3456	3647	0	0	6696	1576
Grp Volume(v), veh/h				402	0	390	1261	1038	0	0	871	230
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1728	1777	0	0	1609	1576
Q Serve(g_s), s				9.5	0.0	23.4	35.2	14.9	0.0	0.0	12.4	13.5
Cycle Q Clear(g_c), s				9.5	0.0	23.4	35.2	14.9	0.0	0.0	12.4	13.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				972	0	446	1349	2279	0	0	1359	333
V/C Ratio(X)				0.41	0.00	0.87	0.93	0.46	0.00	0.00	0.64	0.69
Avail Cap(c_a), veh/h				1491	0	684	1548	3148	0	0	2561	627
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				29.5	0.0	34.5	29.4	9.1	0.0	0.0	36.2	36.6
Incr Delay (d2), s/veh				0.1	0.0	5.4	9.5	0.1	0.0	0.0	0.2	1.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.8	0.0	9.2	15.1	4.8	0.0	0.0	4.7	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				29.6	0.0	40.0	38.9	9.2	0.0	0.0	36.3	37.6
LnGrp LOS				C	A	D	D	A	A	A	D	D
Approach Vol, veh/h					792			2299			1101	
Approach Delay, s/veh					34.7			25.5			36.6	
Approach LOS					C			C			D	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	68.4			43.2			25.2			32.0		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	16.9			37.2			15.5			25.4		
Green Ext Time (p_c), s	5.0			2.0			4.1			1.3		
Intersection Summary												
HCM 6th Ctrl Delay	30.1											
HCM 6th LOS	C											

# HCM 6th Signalized Intersection Summary 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  			 	
Traffic Volume (veh/h)	460	10	805	0	0	0	0	1655	240	310	861	0
Future Volume (veh/h)	460	10	805	0	0	0	0	1655	240	310	861	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1885	1885	1870	1870	0
Adj Flow Rate, veh/h	500	0	882				0	1799	239	337	936	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	1	1	2	2	0
Cap, veh/h	1246	0	1108				0	2300	306	418	1937	0
Arrive On Green	0.35	0.00	0.35				0.00	0.39	0.38	0.12	0.55	0.00
Sat Flow, veh/h	3534	0	3145				0	6097	775	3456	3647	0
Grp Volume(v), veh/h	500	0	882				0	1500	538	337	936	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1621	1744	1728	1777	0
Q Serve(g_s), s	9.7	0.0	22.9				0.0	24.5	24.6	8.6	14.8	0.0
Cycle Q Clear(g_c), s	9.7	0.0	22.9				0.0	24.5	24.6	8.6	14.8	0.0
Prop In Lane	1.00		1.00				0.00		0.44	1.00		0.00
Lane Grp Cap(c), veh/h	1246	0	1108				0	1918	688	418	1937	0
V/C Ratio(X)	0.40	0.00	0.80				0.00	0.78	0.78	0.81	0.48	0.00
Avail Cap(c_a), veh/h	2688	0	2392				0	2252	808	648	2468	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.2	0.0	26.4				0.0	24.1	24.3	38.8	12.7	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.3				0.0	1.3	3.5	2.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	8.0				0.0	8.7	9.9	3.6	5.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	0.0	27.8				0.0	25.3	27.8	40.9	12.8	0.0
LnGrp LOS	C	A	C				A	C	C	D	B	A
Approach Vol, veh/h	1382						2038			1273		
Approach Delay, s/veh	25.8						26.0			20.2		
Approach LOS	C						C			C		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), \$5.0	39.8		36.0		54.7							
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	7.0	40.7	68.5		* 63							
Max Q Clear Time (g_c+I10), s	10.6	26.6	24.9		16.8							
Green Ext Time (p_c), s	0.4	7.9	6.6		4.3							

## Intersection Summary

HCM 6th Ctrl Delay 24.4  
HCM 6th LOS C

## Notes

User approved volume balancing among the lanes for turning movement.














\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 	 		 	
Traffic Volume (veh/h)	30	20	90	535	100	190	340	670	1374	60	790	60
Future Volume (veh/h)	30	20	90	535	100	190	340	670	1374	60	790	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1841	1841	1841	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	33	22	8	582	109	0	370	728	636	65	859	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	4	4	4	2	2	2	5	5	5
Cap, veh/h	46	98	36	721	365	0	410	1768	1366	96	1062	74
Arrive On Green	0.03	0.08	0.07	0.15	0.20	0.00	0.23	0.50	0.50	0.06	0.32	0.31
Sat Flow, veh/h	1697	1239	450	4944	1841	0	1781	3554	2747	1739	3289	230
Grp Volume(v), veh/h	33	0	30	582	109	0	370	728	636	65	453	466
Grp Sat Flow(s),veh/h/ln	1697	0	1689	1648	1841	0	1781	1777	1374	1739	1735	1784
Q Serve(g_s), s	1.4	0.0	1.2	8.2	3.6	0.0	14.6	9.3	10.9	2.6	17.3	17.3
Cycle Q Clear(g_c), s	1.4	0.0	1.2	8.2	3.6	0.0	14.6	9.3	10.9	2.6	17.3	17.3
Prop In Lane	1.00		0.27	1.00		0.00	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	46	0	134	721	365	0	410	1768	1366	96	560	576
V/C Ratio(X)	0.72	0.00	0.22	0.81	0.30	0.00	0.90	0.41	0.47	0.67	0.81	0.81
Avail Cap(c_a), veh/h	118	0	696	823	937	0	420	2380	1840	96	849	873
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.8	0.0	31.2	29.8	24.6	0.0	27.0	11.5	11.9	33.4	22.4	22.4
Incr Delay (d2), s/veh	7.9	0.0	0.3	4.6	0.2	0.0	21.5	0.1	0.1	14.1	1.9	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.5	3.3	1.5	0.0	8.0	3.0	2.7	1.4	6.4	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	0.0	31.5	34.4	24.8	0.0	48.5	11.5	11.9	47.5	24.3	24.3
LnGrp LOS	D	A	C	C	C	A	D	B	B	D	C	C
Approach Vol, veh/h	63		691			1734			984			
Approach Delay, s/veh	37.4		32.9			19.6			25.8			
Approach LOS	D		C			B			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	39.9	14.5	9.7	20.6	27.3	5.9	18.3				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	47.4	12.0	29.1	17.0	34.4	5.0	36.1				
Max Q Clear Time (g_c+14.6), s	4.0	12.9	10.2	3.2	16.6	19.3	3.4	5.6				
Green Ext Time (p_c), s	0.0	4.9	0.3	0.1	0.0	3.0	0.0	0.3				

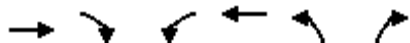
### Intersection Summary

HCM 6th Ctrl Delay	24.3
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Cumulative Plus Project AM Peak Hour








Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	490	964	260	360	465	350
Future Volume (veh/h)	490	964	260	360	465	350
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1366	1366	1856	1856
Adj Flow Rate, veh/h	533	676	283	391	505	380
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	36	36	3	3
Cap, veh/h	1661	735	363	904	817	375
Arrive On Green	0.47	0.47	0.14	0.66	0.24	0.24
Sat Flow, veh/h	3647	1573	2525	1366	3428	1572
Grp Volume(v), veh/h	533	676	283	391	505	380
Grp Sat Flow(s), veh/h/ln	1777	1573	1262	1366	1714	1572
Q Serve(g_s), s	7.5	32.0	8.6	10.8	10.5	19.0
Cycle Q Clear(g_c), s	7.5	32.0	8.6	10.8	10.5	19.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1661	735	363	904	817	375
V/C Ratio(X)	0.32	0.92	0.78	0.43	0.62	1.01
Avail Cap(c_a), veh/h	1961	868	475	1080	817	375
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.3	19.8	32.9	6.4	27.1	30.4
Incr Delay (d2), s/veh	0.0	12.3	6.1	0.1	1.1	50.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	12.3	2.8	2.2	4.3	11.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.3	32.1	39.0	6.5	28.2	80.5
LnGrp LOS	B	C	D	A	C	F
Approach Vol, veh/h	1209			674	885	
Approach Delay, s/veh	23.9			20.2	50.6	
Approach LOS	C			C	D	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		23.0	15.5	41.3		56.7
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		19.0	14.5	43.4		62.4
Max Q Clear Time (g_c+I1), s		21.0	10.6	34.0		12.8
Green Ext Time (p_c), s		0.0	0.4	2.7		1.4
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			31.5			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	20	1105	0	0	0	0	2114	422	200	785	0
Future Volume (veh/h)	270	20	1105	0	0	0	0	2114	422	200	785	0
Initial Q (Qb), veh	0	0	60				0	60	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No				No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1826	1826	0
Adj Flow Rate, veh/h	293	22	673				0	2298	437	217	853	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	589	0	603				0	2884	406	280	3757	0
Arrive On Green	0.18	0.18	0.18				0.00	0.61	0.61	0.08	0.75	0.00
Sat Flow, veh/h	3456	0	3614				0	5021	803	3374	5149	0
Grp Volume(v), veh/h	293	0	673				0	1805	930	217	853	0
Grp Sat Flow(s),veh/h/ln	1728	0	1205				0	1122	1710	1687	1662	0
Q Serve(g_s), s	7.8	0.0	18.0				0.0	45.6	47.2	6.4	5.4	0.0
Cycle Q Clear(g_c), s	7.8	0.0	18.0				0.0	45.6	47.2	6.4	5.4	0.0
Prop In Lane	1.00		1.00				0.00		0.47	1.00		0.00
Lane Grp Cap(c), veh/h	589	0	603				0	2099	1076	280	3757	0
V/C Ratio(X)	0.50	0.00	1.12				0.00	0.86	0.86	0.77	0.23	0.00
Avail Cap(c_a), veh/h	609	0	637				0	2240	1138	396	3717	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.7	0.0	44.9				0.0	18.4	17.8	47.5	3.9	0.0
Incr Delay (d2), s/veh	0.2	0.0	72.5				0.0	3.2	6.4	3.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	358.0				0.0	23.6	10.3	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	29.2				0.0	17.5	22.5	2.8	1.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.0	0.0	475.4				0.0	45.2	34.5	51.1	3.9	0.0
LnGrp LOS	D	A	F				A	D	C	D	A	A
Approach Vol, veh/h	966						2735				1070	
Approach Delay, s/veh	343.3						41.6				13.4	
Approach LOS	F						D				B	
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	3.4	66.7	22.0		80.2							
Change Period (Y+Rc), s	4.9	* 4.9	5.3		4.9							
Max Green Setting (Gmax), s	2.0	* 67	16.7		46.1							
Max Q Clear Time (g_c+I), s	13.4	49.2	20.0		7.4							
Green Ext Time (p_c), s	0.1	12.7	0.0		3.9							

### Intersection Summary

HCM 6th Ctrl Delay	96.4
HCM 6th LOS	F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Contra Loma Plaza/Davison Drive

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↱	↰	↱		↰	↱	↱
Traffic Volume (veh/h)	40	30	30	220	40	260	40	1865	170	180	916	30
Future Volume (veh/h)	40	30	30	220	40	260	40	1865	170	180	916	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	33	0	239	43	28	43	2027	182	196	996	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	1	1	1	2	2	2	2	2	2
Cap, veh/h	74	57	115	279	293	248	55	1903	168	251	2169	70
Arrive On Green	0.07	0.07	0.00	0.16	0.16	0.16	0.03	0.58	0.57	0.07	0.62	0.61
Sat Flow, veh/h	1021	784	1572	1795	1885	1595	1781	3302	292	3456	3511	113
Grp Volume(v), veh/h	76	0	0	239	43	28	43	1076	1133	196	504	524
Grp Sat Flow(s), veh/h/ln	1804	0	1572	1795	1885	1595	1781	1777	1817	1728	1777	1847
Q Serve(g_s), s	5.3	0.0	0.0	16.9	2.6	2.0	3.1	75.0	75.0	7.3	19.7	19.7
Cycle Q Clear(g_c), s	5.3	0.0	0.0	16.9	2.6	2.0	3.1	75.0	75.0	7.3	19.7	19.7
Prop In Lane	0.57		1.00	1.00		1.00	1.00		0.16	1.00		0.06
Lane Grp Cap(c), veh/h	131	0	115	279	293	248	55	1024	1047	251	1098	1141
V/C Ratio(X)	0.58	0.00	0.00	0.86	0.15	0.11	0.78	1.05	1.08	0.78	0.46	0.46
Avail Cap(c_a), veh/h	485	0	423	524	550	466	219	1024	1047	425	1098	1141
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	0.0	0.0	53.5	47.5	47.3	62.6	27.6	27.6	59.3	13.3	13.3
Incr Delay (d2), s/veh	1.5	0.0	0.0	3.0	0.1	0.1	8.3	42.5	52.7	2.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	7.7	1.2	0.8	1.5	40.5	44.4	3.3	7.7	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.9	0.0	0.0	56.5	47.6	47.3	70.9	70.1	80.4	61.4	13.4	13.4
LnGrp LOS	E	A	A	E	D	D	E	F	F	E	B	B
Approach Vol, veh/h	76			310			2252			1224		
Approach Delay, s/veh	59.9			54.4			75.3			21.1		
Approach LOS	E			D			E			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.4	79.0		13.5	8.1	84.4		24.2				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+19.3), s	19.3	77.0		7.3	5.1	21.7		18.9				
Green Ext Time (p_c), s	0.2	0.0		0.2	0.0	5.0		0.4				

### Intersection Summary

HCM 6th Ctrl Delay	56.1
HCM 6th LOS	E



# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	150	90	90	200	900	100	1036	30	540	979	150
Future Volume (veh/h)	160	150	90	90	200	900	100	1036	30	540	979	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	174	163	35	98	217	978	109	1126	32	587	1064	84
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	2	2	2
Cap, veh/h	195	1036	217	112	1104	1370	244	1065	30	632	1202	696
Arrive On Green	0.11	0.36	0.35	0.06	0.31	0.30	0.14	0.30	0.29	0.18	0.34	0.33
Sat Flow, veh/h	1781	2915	610	1795	3582	2812	1795	3555	101	3456	3554	1582
Grp Volume(v), veh/h	174	98	100	98	217	978	109	567	591	587	1064	84
Grp Sat Flow(s), veh/h/ln	1781	1777	1749	1795	1791	1406	1795	1791	1865	1728	1777	1582
Q Serve(g_s), s	15.4	6.0	6.3	8.7	7.1	43.8	8.9	48.0	48.0	26.8	45.3	3.0
Cycle Q Clear(g_c), s	15.4	6.0	6.3	8.7	7.1	43.8	8.9	48.0	48.0	26.8	45.3	3.0
Prop In Lane	1.00		0.35	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	195	631	621	112	1104	1370	244	537	559	632	1202	696
V/C Ratio(X)	0.89	0.15	0.16	0.87	0.20	0.71	0.45	1.06	1.06	0.93	0.89	0.12
Avail Cap(c_a), veh/h	256	821	808	112	1364	1574	244	537	559	690	1531	842
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.4	35.2	35.4	74.5	40.8	32.3	63.7	56.1	56.1	64.4	50.1	11.8
Incr Delay (d2), s/veh	21.7	0.0	0.0	47.0	0.0	1.0	0.5	54.7	54.1	17.5	4.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	2.6	2.7	5.4	3.2	14.6	4.1	29.3	30.4	13.4	20.9	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	92.1	35.3	35.4	121.4	40.8	33.3	64.1	110.8	110.2	81.9	54.7	11.8
LnGrp LOS	F	D	D	F	D	C	E	F	F	F	D	B
Approach Vol, veh/h					1293				1267			
Approach Delay, s/veh					41.2				106.5			
Approach LOS	E				D				F			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.3	52.0	14.0	60.9	27.1	58.2	21.5	53.4				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	37.0	46.7	10.0	73.4	11.0	* 68	23.0	60.4				
Max Q Clear Time (g_c+20.0), s	20.8	50.0	10.7	8.3	10.9	47.3	17.4	45.8				
Green Ext Time (p_c), s	0.5	0.0	0.0	0.6	0.0	5.6	0.1	3.0				

### Intersection Summary

HCM 6th Ctrl Delay 68.3

HCM 6th LOS E

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	60	911	10	150	90	855	1475	20	80	936	170
Future Volume (veh/h)	200	60	911	10	150	90	855	1475	20	80	936	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	141	171	123	11	163	8	929	1603	9	87	1017	164
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	2	2	2
Cap, veh/h	222	233	395	15	215	192	1014	1883	821	111	1280	206
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.29	0.53	0.53	0.06	0.29	0.28
Sat Flow, veh/h	1795	1885	3195	118	1747	1556	3483	3582	1562	1781	4419	711
Grp Volume(v), veh/h	141	171	123	174	0	8	929	1603	9	87	783	398
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1864	0	1556	1742	1791	1562	1781	1702	1725
Q Serve(g_s), s	7.2	8.5	3.4	8.7	0.0	0.4	25.0	37.2	0.3	4.7	20.6	20.7
Cycle Q Clear(g_c), s	7.2	8.5	3.4	8.7	0.0	0.4	25.0	37.2	0.3	4.7	20.6	20.7
Prop In Lane	1.00		1.00	0.06		1.00	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	222	233	395	230	0	192	1014	1883	821	111	986	500
V/C Ratio(X)	0.64	0.73	0.31	0.76	0.00	0.04	0.92	0.85	0.01	0.78	0.79	0.80
Avail Cap(c_a), veh/h	334	350	594	751	0	626	1187	2071	903	202	1195	606
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	40.9	38.7	41.1	0.0	37.4	33.2	19.7	11.0	44.8	31.7	31.9
Incr Delay (d2), s/veh	1.1	1.7	0.2	1.9	0.0	0.0	9.3	3.1	0.0	4.5	2.5	4.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.9	1.3	4.0	0.0	0.2	11.1	14.2	0.1	2.2	8.6	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	41.5	42.6	38.9	43.0	0.0	37.5	42.5	22.8	11.0	49.2	34.2	36.8
LnGrp LOS	D	D	D	D	A	D	D	C	B	D	C	D
Approach Vol, veh/h	435			182			2541			1268		
Approach Delay, s/veh	41.2			42.8			30.0			36.1		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	54.9			16.0	32.2	32.8		15.9				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	54.7			17.1	33.0	* 33		39.0				
Max Q Clear Time (g_c+10, s)	39.2			10.5	27.0	22.7		10.7				
Green Ext Time (p_c), s	0.0	7.1		0.6	1.2	4.3		0.5				

### Intersection Summary

HCM 6th Ctrl Delay	33.3
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↑↑ ↱			↰ ↑↑ ↱			↰ ↱		↑	↰ ↱	↰ ↱	↱
Traffic Volume (veh/h)	50	1023	255	202	1341	80	459	150	181	70	181	120
Future Volume (veh/h)	50	1023	255	202	1341	80	459	150	181	70	181	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	54	1112	169	220	1458	16	499	163	23	76	197	112
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	70	1330	202	251	2082	23	560	686	567	98	288	164
Arrive On Green	0.04	0.30	0.29	0.14	0.40	0.40	0.16	0.36	0.36	0.05	0.26	0.25
Sat Flow, veh/h	1795	4497	683	1795	5247	58	3483	1885	1559	1810	1119	636
Grp Volume(v), veh/h	54	848	433	220	953	521	499	163	23	76	0	309
Grp Sat Flow(s),veh/h/ln	1795	1716	1749	1795	1716	1873	1742	1885	1559	1810	0	1755
Q Serve(g_s), s	3.3	25.2	25.3	13.1	25.3	25.3	15.3	6.6	1.0	4.5	0.0	17.4
Cycle Q Clear(g_c), s	3.3	25.2	25.3	13.1	25.3	25.3	15.3	6.6	1.0	4.5	0.0	17.4
Prop In Lane	1.00		0.39	1.00		0.03	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	70	1015	517	251	1362	743	560	686	567	98	0	451
V/C Ratio(X)	0.77	0.84	0.84	0.88	0.70	0.70	0.89	0.24	0.04	0.78	0.00	0.68
Avail Cap(c_a), veh/h	148	1301	663	395	1773	968	606	822	680	182	0	637
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.0	36.0	36.0	46.0	27.5	27.5	44.9	24.2	22.4	51.0	0.0	36.8
Incr Delay (d2), s/veh	6.7	3.1	6.0	8.1	0.5	0.8	13.9	0.1	0.0	4.9	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	10.5	11.1	6.2	9.8	10.8	7.4	2.8	0.4	2.1	0.0	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.6	39.1	42.0	54.1	28.0	28.3	58.8	24.3	22.4	55.9	0.0	37.5
LnGrp LOS	E	D	D	D	C	C	E	C	C	E	A	D
Approach Vol, veh/h	1335				1694		685				385	
Approach Delay, s/veh	40.8				31.5		49.3				41.1	
Approach LOS	D				C		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	43.7	19.3	36.3	21.5	32.1	8.2	47.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	1.0	46.3	24.0	* 41	19.0	38.3	9.0	* 56				
Max Q Clear Time (g_c+10), s	10.5	8.6	15.1	27.3	17.3	19.4	5.3	27.3				
Green Ext Time (p_c), s	0.0	0.5	0.2	4.6	0.2	1.0	0.0	6.8				

### Intersection Summary

HCM 6th Ctrl Delay 38.4

HCM 6th LOS D





























### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Cumulative Plus Project AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 		 	 	
Traffic Volume (veh/h)	40	761	317	305	970	310	475	421	153	390	605	30
Future Volume (veh/h)	40	761	317	305	970	310	475	421	153	390	605	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	43	827	92	332	1054	129	516	458	143	424	658	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	55	1208	133	358	1973	241	546	722	223	483	877	40
Arrive On Green	0.03	0.26	0.25	0.20	0.43	0.42	0.16	0.27	0.26	0.14	0.25	0.24
Sat Flow, veh/h	1795	4670	516	1781	4602	562	3483	2675	828	3483	3483	159
Grp Volume(v), veh/h	43	606	313	332	779	404	516	305	296	424	338	350
Grp Sat Flow(s),veh/h/ln	1795	1716	1755	1781	1702	1760	1742	1791	1712	1742	1791	1850
Q Serve(g_s), s	2.9	19.3	19.5	22.2	20.6	20.7	17.8	18.2	18.5	14.5	21.1	21.2
Cycle Q Clear(g_c), s	2.9	19.3	19.5	22.2	20.6	20.7	17.8	18.2	18.5	14.5	21.1	21.2
Prop In Lane	1.00		0.29	1.00		0.32	1.00		0.48	1.00		0.09
Lane Grp Cap(c), veh/h	55	887	454	358	1459	754	546	484	462	483	451	466
V/C Ratio(X)	0.78	0.68	0.69	0.93	0.53	0.54	0.95	0.63	0.64	0.88	0.75	0.75
Avail Cap(c_a), veh/h	89	1075	550	397	1656	856	546	576	551	574	591	610
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	40.5	40.7	47.6	25.7	25.9	50.6	39.0	39.4	51.2	41.8	41.9
Incr Delay (d2), s/veh	8.4	0.9	1.8	25.4	0.1	0.2	25.4	0.9	1.0	11.5	2.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	8.0	8.4	12.1	7.9	8.3	9.4	7.9	7.7	6.9	9.3	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.7	41.3	42.5	73.0	25.8	26.1	76.0	39.8	40.4	62.8	44.3	44.4
LnGrp LOS	E	D	D	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h		962			1515			1117			1112	
Approach Delay, s/veh		42.9			36.2			56.7			51.4	
Approach LOS		D			D			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.8	36.7	28.4	35.4	23.0	34.5	7.7	56.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+I1), s	16.5	20.5	24.2	21.5	19.8	23.2	4.9	22.7				
Green Ext Time (p_c), s	0.3	1.9	0.2	3.3	0.0	2.1	0.0	5.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			46.0									
HCM 6th LOS			D									

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱ ↲			↰ ↱ ↲			↰ ↱			↰ ↱		
Traffic Volume (veh/h)	321	950	120	111	1220	310	300	499	263	480	224	322
Future Volume (veh/h)	321	950	120	111	1220	310	300	499	263	480	224	322
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	338	1000	49	117	1284	133	316	525	215	505	236	192
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	237	1908	93	146	1692	523	221	667	272	357	889	389
Arrive On Green	0.13	0.38	0.37	0.08	0.33	0.33	0.12	0.27	0.26	0.10	0.25	0.25
Sat Flow, veh/h	1781	4982	244	1781	5106	1578	1795	2481	1012	3483	3582	1568
Grp Volume(v), veh/h	338	683	366	117	1284	133	316	378	362	505	236	192
Grp Sat Flow(s),veh/h/ln	1781	1702	1822	1781	1702	1578	1795	1791	1702	1742	1791	1568
Q Serve(g_s), s	13.0	15.1	15.2	6.3	21.9	6.0	12.0	19.1	19.3	10.0	5.2	10.2
Cycle Q Clear(g_c), s	13.0	15.1	15.2	6.3	21.9	6.0	12.0	19.1	19.3	10.0	5.2	10.2
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.59	1.00		1.00
Lane Grp Cap(c), veh/h	237	1303	698	146	1692	523	221	481	457	357	889	389
V/C Ratio(X)	1.42	0.52	0.52	0.80	0.76	0.25	1.43	0.79	0.79	1.41	0.27	0.49
Avail Cap(c_a), veh/h	237	1686	902	201	2424	749	221	821	780	357	1568	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.3	23.2	23.3	44.0	29.1	23.8	42.8	33.1	33.5	43.8	29.5	31.4
Incr Delay (d2), s/veh	213.3	0.1	0.2	10.4	0.4	0.1	217.7	1.1	1.2	202.1	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	5.6	6.1	3.1	8.4	2.1	18.4	7.9	7.7	14.2	2.1	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	255.6	23.3	23.5	54.4	29.6	23.9	260.5	34.2	34.7	245.9	29.6	31.8
LnGrp LOS	F	C	C	D	C	C	F	C	C	F	C	C
Approach Vol, veh/h	1387			1534			1056			933		
Approach Delay, s/veh	80.0			31.0			102.1			147.1		
Approach LOS	E			C			F			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.0	30.2	12.0	41.3	16.0	28.2	17.0	36.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	4.0	43.4	11.0	47.0	12.0	41.4	13.0	45.0				
Max Q Clear Time (g_c+1/2C), s	4.0	21.3	8.3	17.2	14.0	12.2	15.0	23.9				
Green Ext Time (p_c), s	0.0	2.6	0.0	4.3	0.0	1.2	0.0	6.1				

### Intersection Summary

HCM 6th Ctrl Delay	82.2
HCM 6th LOS	F

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1815	850	290	1505	0	0	0	0	790	10	920
Future Volume (veh/h)	0	1815	850	290	1505	0	0	0	0	790	10	920
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1973	456	315	1636	0				867	0	972
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	1	1	0				2	2	2
Cap, veh/h	0	1691	524	226	2426	0				1680	0	747
Arrive On Green	0.00	0.33	0.33	0.11	0.47	0.00				0.47	0.00	0.47
Sat Flow, veh/h	0	5316	1596	1975	5316	0				3563	0	1585
Grp Volume(v), veh/h	0	1973	456	315	1636	0				867	0	972
Grp Sat Flow(s),veh/h/ln	0	1716	1596	987	1716	0				1781	0	1585
Q Serve(g_s), s	0.0	46.0	37.6	16.0	34.5	0.0				23.8	0.0	66.0
Cycle Q Clear(g_c), s	0.0	46.0	37.6	16.0	34.5	0.0				23.8	0.0	66.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1691	524	226	2426	0				1680	0	747
V/C Ratio(X)	0.00	1.17	0.87	1.40	0.67	0.00				0.52	0.00	1.30
Avail Cap(c_a), veh/h	0	1691	524	226	2426	0				1680	0	747
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	47.0	44.2	62.0	28.7	0.0				25.8	0.0	37.0
Incr Delay (d2), s/veh	0.0	81.9	14.0	202.7	0.6	0.0				0.1	0.0	145.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	31.7	16.4	10.3	13.7	0.0				9.8	0.0	54.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	128.9	58.2	264.7	29.3	0.0				26.0	0.0	182.1
LnGrp LOS	A	F	E	F	C	A				C	A	F
Approach Vol, veh/h		2429			1951						1839	
Approach Delay, s/veh		115.6			67.3						108.5	
Approach LOS		F			E						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	30.0	50.0		70.0		70.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	60.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I1), s	11.0	48.0		68.0		36.5						
Green Ext Time (p_c), s	0.0	0.0		0.0		8.8						

### Intersection Summary

HCM 6th Ctrl Delay 98.3  
HCM 6th LOS F

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↑	↑	↑↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1935	670	170	1035	620	760	50	930	0	0	0
Future Volume (veh/h)	0	1935	670	170	1035	620	760	50	930	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	0	2103	449	185	1125	321	865	0	876			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2			
Cap, veh/h	0	2042	633	163	2681	809	1455	0	647			
Arrive On Green	0.00	0.40	0.40	0.09	0.52	0.52	0.41	0.00	0.41			
Sat Flow, veh/h	0	5274	1583	1781	5106	1540	3563	0	1584			
Grp Volume(v), veh/h	0	2103	449	185	1125	321	865	0	876			
Grp Sat Flow(s),veh/h/ln	0	1702	1583	1781	1702	1540	1781	0	1584			
Q Serve(g_s), s	0.0	48.0	28.5	11.0	16.1	15.0	22.8	0.0	49.0			
Cycle Q Clear(g_c), s	0.0	48.0	28.5	11.0	16.1	15.0	22.8	0.0	49.0			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2042	633	163	2681	809	1455	0	647			
V/C Ratio(X)	0.00	1.03	0.71	1.13	0.42	0.40	0.59	0.00	1.35			
Avail Cap(c_a), veh/h	0	2042	633	163	2681	809	1455	0	647			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	36.0	30.2	54.5	17.4	17.1	27.7	0.0	35.5			
Incr Delay (d2), s/veh	0.0	28.0	3.2	110.6	0.0	0.1	0.5	0.0	169.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	23.9	10.8	9.8	5.9	5.0	9.3	0.0	48.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	64.0	33.3	165.1	17.4	17.2	28.2	0.0	205.0			
LnGrp LOS	A	F	C	F	B	B	C	A	F			
Approach Vol, veh/h	2552		1631				1741					
Approach Delay, s/veh	58.6		34.1				117.2					
Approach LOS	E		C				F					
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), \$5.0	52.0		53.0		67.0							
Change Period (Y+Rc), s	4.0	5.3	5.3		5.3							
Max Green Setting (Gmax), s	1.0	46.7	47.7		61.7							
Max Q Clear Time (g_c+113, s)	1.0	50.0	51.0		18.1							
Green Ext Time (p_c), s	0.0	0.0	0.0		6.3							

### Intersection Summary

HCM 6th Ctrl Delay 69.1

HCM 6th LOS E

### Notes

User approved volume balancing among the lanes for turning movement.











# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Cumulative Plus Project AM Peak Hour











Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	170	12	15	70	378	12	306	32	410	374	80
Future Volume (veh/h)	80	170	12	15	70	378	12	306	32	410	374	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	87	185	12	16	76	260	13	333	24	446	407	69
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	132	496	32	93	95	325	94	615	44	483	1219	205
Arrive On Green	0.07	0.29	0.29	0.05	0.26	0.26	0.05	0.18	0.17	0.27	0.40	0.38
Sat Flow, veh/h	1781	1735	113	1767	360	1231	1795	3378	242	1795	3061	515
Grp Volume(v), veh/h	87	0	197	16	0	336	13	176	181	446	237	239
Grp Sat Flow(s),veh/h/ln	1781	0	1848	1767	0	1591	1795	1791	1829	1795	1791	1785
Q Serve(g_s), s	3.6	0.0	6.5	0.7	0.0	15.0	0.5	6.8	6.9	18.4	7.0	7.1
Cycle Q Clear(g_c), s	3.6	0.0	6.5	0.7	0.0	15.0	0.5	6.8	6.9	18.4	7.0	7.1
Prop In Lane	1.00		0.06	1.00		0.77	1.00		0.13	1.00		0.29
Lane Grp Cap(c), veh/h	132	0	528	93	0	420	94	326	333	483	713	711
V/C Ratio(X)	0.66	0.00	0.37	0.17	0.00	0.80	0.14	0.54	0.54	0.92	0.33	0.34
Avail Cap(c_a), veh/h	258	0	875	256	0	754	496	1202	1227	496	1202	1198
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	0.0	21.7	34.4	0.0	26.1	34.4	28.2	28.3	27.0	15.9	16.0
Incr Delay (d2), s/veh	2.1	0.0	0.2	0.3	0.0	1.3	0.2	0.5	0.5	22.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	2.6	0.3	0.0	5.3	0.2	2.7	2.8	10.0	2.5	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.3	0.0	21.9	34.7	0.0	27.4	34.6	28.7	28.8	49.4	16.0	16.1
LnGrp LOS	D	A	C	C	A	C	C	C	C	D	B	B
Approach Vol, veh/h	284		352			370			922			
Approach Delay, s/veh	26.3		27.8			29.0			32.2			
Approach LOS	C		C			C			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.4	17.8	8.0	25.7	8.0	34.3	9.6	24.1				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+Tb), s	8.9	8.9	2.7	8.5	2.5	9.1	5.6	17.0				
Green Ext Time (p_c), s	0.1	1.2	0.0	0.6	0.0	1.6	0.0	1.2				
Intersection Summary												
HCM 6th Ctrl Delay			29.9									
HCM 6th LOS			C									

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	210	212	181	210	160	148	834	183	150	1201	140
Future Volume (veh/h)	140	210	212	181	210	160	148	834	183	150	1201	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	152	228	196	197	228	149	161	907	179	163	1305	143
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	181	247	212	228	306	200	148	1051	207	192	1223	133
Arrive On Green	0.10	0.27	0.27	0.13	0.29	0.29	0.08	0.35	0.34	0.11	0.38	0.36
Sat Flow, veh/h	1795	929	798	1781	1046	684	1795	2979	588	1795	3248	354
Grp Volume(v), veh/h	152	0	424	197	0	377	161	545	541	163	717	731
Grp Sat Flow(s),veh/h/ln	1795	0	1727	1781	0	1730	1795	1791	1776	1795	1791	1811
Q Serve(g_s), s	9.0	0.0	26.0	11.8	0.0	21.5	9.0	30.8	30.9	9.7	41.0	41.0
Cycle Q Clear(g_c), s	9.0	0.0	26.0	11.8	0.0	21.5	9.0	30.8	30.9	9.7	41.0	41.0
Prop In Lane	1.00		0.46	1.00		0.40	1.00		0.33	1.00		0.20
Lane Grp Cap(c), veh/h	181	0	459	228	0	506	148	631	626	192	675	682
V/C Ratio(X)	0.84	0.00	0.92	0.87	0.00	0.74	1.08	0.86	0.86	0.85	1.06	1.07
Avail Cap(c_a), veh/h	247	0	540	327	0	620	148	631	626	198	675	682
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	0.0	38.9	46.6	0.0	34.8	49.9	32.8	33.0	47.7	33.9	34.0
Incr Delay (d2), s/veh	12.7	0.0	18.6	11.5	0.0	2.8	98.2	11.4	11.5	25.9	52.3	55.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	12.8	5.8	0.0	9.0	8.0	14.5	14.5	5.6	26.4	27.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.7	0.0	57.5	58.0	0.0	37.7	148.1	44.1	44.5	73.6	86.2	89.5
LnGrp LOS	E	A	E	E	A	D	F	D	D	E	F	F
Approach Vol, veh/h	576			574			1247			1611		
Approach Delay, s/veh	58.3			44.6			57.7			86.4		
Approach LOS	E			D			E			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), \$5.6	42.4	17.9	32.9	13.0	45.0	15.0	35.8					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	2.0	36.7	20.0	34.0	9.0	39.7	15.0	39.0				
Max Q Clear Time (g_c+I1), s	11.3	32.9	13.8	28.0	11.0	43.0	11.0	23.5				
Green Ext Time (p_c), s	0.0	1.7	0.1	0.9	0.0	0.0	0.1	1.2				

### Intersection Summary










HCM 6th Ctrl Delay	67.5
HCM 6th LOS	E

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	0	12	50	0	170	6	1147	70	360	1104	41
Future Volume (veh/h)	57	0	12	50	0	170	6	1147	70	360	1104	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	0	1900	1870	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	62	0	13	54	0	7	7	1247	42	391	1200	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	0	0	2	1	1	1	1	1
Cap, veh/h	242	0	116	0	0	0	338	1603	697	446	2721	102
Arrive On Green	0.07	0.00	0.06	0.00	0.00	0.00	0.45	0.45	0.45	0.25	0.77	0.75
Sat Flow, veh/h	1409	0	1585		0		447	3582	1557	1795	3520	132
Grp Volume(v), veh/h	62	0	13		0.0		7	1247	42	391	610	635
Grp Sat Flow(s),veh/h/ln	1409	0	1585				447	1791	1557	1795	1791	1861
Q Serve(g_s), s	2.2	0.0	0.4				0.5	15.3	0.8	10.9	6.1	6.2
Cycle Q Clear(g_c), s	2.2	0.0	0.4				0.5	15.3	0.8	10.9	6.1	6.2
Prop In Lane	1.00		1.00				1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	242	0	116				338	1603	697	446	1384	1439
V/C Ratio(X)	0.26	0.00	0.11				0.02	0.78	0.06	0.88	0.44	0.44
Avail Cap(c_a), veh/h	1059	0	1036				396	2066	898	483	1653	1718
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	0.0	22.8				8.1	12.2	8.2	18.8	2.0	2.1
Incr Delay (d2), s/veh	0.6	0.0	0.4				0.0	1.1	0.0	14.7	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.2				0.0	4.5	0.2	5.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.9	0.0	23.2				8.1	13.2	8.2	33.5	2.1	2.1
LnGrp LOS	C	A	C				A	B	A	C	A	A
Approach Vol, veh/h	75						1296			1636		
Approach Delay, s/veh	23.8						13.0			9.6		
Approach LOS	C						B			A		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	6.9	27.3	7.8		44.2							
Change Period (Y+Rc), s	4.0	5.3	4.5		5.3							
Max Green Setting (Gmax), s	4.0	28.7	33.5		46.7							
Max Q Clear Time (g_c+I12, s)	17.3		4.2		8.2							
Green Ext Time (p_c), s	0.1	4.5	0.2		5.3							

### Intersection Summary










HCM 6th Ctrl Delay	11.4
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	162	38	90	123	453	16	463	70	570	702	32
Future Volume (veh/h)	86	162	38	90	123	453	16	463	70	570	702	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	93	176	41	98	134	74	17	503	66	620	763	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	147	252	213	149	306	160	30	778	102	800	1592	71
Arrive On Green	0.08	0.13	0.13	0.08	0.13	0.13	0.02	0.24	0.22	0.23	0.46	0.43
Sat Flow, veh/h	1810	1900	1607	1795	2274	1186	1810	3204	419	3483	3493	156
Grp Volume(v), veh/h	93	176	41	98	104	104	17	282	287	620	391	406
Grp Sat Flow(s),veh/h/ln	1810	1900	1607	1795	1791	1669	1810	1805	1818	1742	1791	1857
Q Serve(g_s), s	2.6	4.5	1.2	2.7	2.7	3.0	0.5	7.2	7.3	8.6	7.8	7.8
Cycle Q Clear(g_c), s	2.6	4.5	1.2	2.7	2.7	3.0	0.5	7.2	7.3	8.6	7.8	7.8
Prop In Lane	1.00		1.00	1.00		0.71	1.00		0.23	1.00		0.08
Lane Grp Cap(c), veh/h	147	252	213	149	241	225	30	438	441	800	816	846
V/C Ratio(X)	0.63	0.70	0.19	0.66	0.43	0.46	0.56	0.64	0.65	0.77	0.48	0.48
Avail Cap(c_a), veh/h	599	1591	1345	385	1291	1202	176	1160	1169	2510	2267	2351
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.8	21.3	19.8	22.8	20.4	20.5	25.1	17.5	17.6	18.5	9.7	9.8
Incr Delay (d2), s/veh	4.4	1.3	0.2	4.8	0.5	0.6	5.9	0.6	0.6	0.6	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.8	0.4	1.2	1.0	1.0	0.2	2.5	2.6	3.1	2.5	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	22.6	20.0	27.7	20.9	21.1	30.9	18.0	18.2	19.1	9.9	9.9
LnGrp LOS	C	C	B	C	C	C	C	B	B	B	A	A
Approach Vol, veh/h	310			306			586			1417		
Approach Delay, s/veh	23.6			23.1			18.5			14.0		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.5	8.3	10.8	4.9	27.4	8.2	10.9					
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0				
Max Green Setting (Gmax), s	31.7	31.7	10.5	43.0	5.0	63.7	16.5	37.0				
Max Q Clear Time (g_c+I10), s	9.3	9.3	4.7	6.5	2.5	9.8	4.6	5.0				
Green Ext Time (p_c), s	1.2	1.9	0.1	0.6	0.0	3.5	0.1	0.7				

### Intersection Summary









HCM 6th Ctrl Delay	17.2
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	690	30	90	918	130	150	210	270	120	50	154
Future Volume (veh/h)	119	690	30	90	918	130	150	210	270	120	50	154
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	129	750	29	98	998	130	163	228	92	130	54	49
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	162	1265	49	130	1090	142	197	837	327	164	591	477
Arrive On Green	0.09	0.36	0.36	0.07	0.34	0.34	0.11	0.34	0.33	0.09	0.32	0.31
Sat Flow, veh/h	1781	3488	135	1781	3162	412	1781	2495	976	1781	1868	1508
Grp Volume(v), veh/h	129	382	397	98	561	567	163	160	160	130	51	52
Grp Sat Flow(s),veh/h/ln	1781	1777	1846	1781	1777	1796	1781	1777	1695	1781	1777	1599
Q Serve(g_s), s	8.3	20.4	20.4	6.3	35.3	35.4	10.5	7.7	8.1	8.4	2.4	2.7
Cycle Q Clear(g_c), s	8.3	20.4	20.4	6.3	35.3	35.4	10.5	7.7	8.1	8.4	2.4	2.7
Prop In Lane	1.00		0.07	1.00		0.23	1.00		0.58	1.00		0.94
Lane Grp Cap(c), veh/h	162	645	670	130	612	619	197	596	568	164	563	506
V/C Ratio(X)	0.80	0.59	0.59	0.75	0.92	0.92	0.83	0.27	0.28	0.79	0.09	0.10
Avail Cap(c_a), veh/h	168	645	670	201	639	646	213	596	568	192	563	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	30.2	30.2	53.1	36.7	36.7	50.9	28.4	28.6	52.0	28.1	28.4
Incr Delay (d2), s/veh	22.2	1.5	1.4	8.5	17.6	17.6	21.4	1.1	1.2	17.5	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	8.6	8.9	3.1	17.5	17.7	5.7	3.4	3.4	4.4	1.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.2	31.7	31.7	61.7	54.3	54.3	72.3	29.5	29.8	69.5	28.4	28.8
LnGrp LOS	E	C	C	E	D	D	E	C	C	E	C	C
Approach Vol, veh/h	908			1226			483			233		
Approach Delay, s/veh	37.7			54.9			44.0			51.4		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.7	43.2	12.5	46.4	16.9	41.0	14.6	44.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	37.9	12.7	39.3	13.5	36.5	10.5	41.5					
Max Q Clear Time (g_c+I10), s	10.1	8.3	22.4	12.5	4.7	10.3	37.4					
Green Ext Time (p_c), s	0.0	1.7	0.1	4.0	0.0	0.5	0.0	2.4				

### Intersection Summary

HCM 6th Ctrl Delay 47.3

HCM 6th LOS D

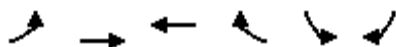
### Notes

User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

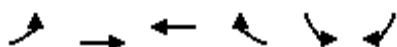
The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	82	993	1079	880	310	58
Future Volume (veh/h)	82	993	1079	880	310	58
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	86	1045	1136	453	326	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	123	2085	1628	726	1020	468
Arrive On Green	0.07	0.59	0.46	0.46	0.30	0.30
Sat Flow, veh/h	1781	3647	3647	1585	3456	1585
Grp Volume(v), veh/h	86	1045	1136	453	326	20
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1728	1585
Q Serve(g_s), s	3.2	11.7	17.2	14.7	5.0	0.6
Cycle Q Clear(g_c), s	3.2	11.7	17.2	14.7	5.0	0.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	123	2085	1628	726	1020	468
V/C Ratio(X)	0.70	0.50	0.70	0.62	0.32	0.04
Avail Cap(c_a), veh/h	210	3253	2623	1170	1020	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	8.2	14.6	13.9	18.6	17.0
Incr Delay (d2), s/veh	6.9	0.2	0.5	0.9	0.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	3.2	5.6	4.4	1.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.7	8.4	15.2	14.8	19.4	17.2
LnGrp LOS	D	A	B	B	B	B
Approach Vol, veh/h		1131	1589		346	
Approach Delay, s/veh		10.6	15.1		19.3	
Approach LOS		B	B		B	
Timer - Assigned Phs			4	6	7	8
Phs Duration (G+Y+Rc), s			43.7	24.0	8.7	35.0
Change Period (Y+Rc), s			4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s			61.5	19.5	7.5	49.5
Max Q Clear Time (g_c+I1), s			13.7	7.0	5.2	19.2
Green Ext Time (p_c), s			8.6	0.9	0.0	11.3
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			13.9			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	379	1063	1850	570	960	190
Future Volume (veh/h)	379	1063	1850	570	960	190
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	399	1119	1947	392	1011	75
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	312	3617	1777	793	784	359
Arrive On Green	0.17	0.71	0.50	0.50	0.22	0.22
Sat Flow, veh/h	1781	5274	3647	1585	3483	1598
Grp Volume(v), veh/h	399	1119	1947	392	1011	75
Grp Sat Flow(s), veh/h/ln	1781	1702	1777	1585	1742	1598
Q Serve(g_s), s	21.0	9.8	60.0	19.7	27.0	4.6
Cycle Q Clear(g_c), s	21.0	9.8	60.0	19.7	27.0	4.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	312	3617	1777	793	784	359
V/C Ratio(X)	1.28	0.31	1.10	0.49	1.29	0.21
Avail Cap(c_a), veh/h	312	3617	1777	793	784	359
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	6.5	30.0	19.9	46.5	37.8
Incr Delay (d2), s/veh	148.4	0.0	52.6	0.2	140.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.9	2.9	36.3	6.9	26.5	1.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	197.9	6.6	82.6	20.1	186.5	37.9
LnGrp LOS	F	A	F	C	F	D
Approach Vol, veh/h		1518	2339		1086	
Approach Delay, s/veh		56.8	72.1		176.3	
Approach LOS		E	E		F	
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		89.0			25.0	64.0
Change Period (Y+Rc), s		5.3			4.5	5.3
Max Green Setting (Gmax), s		83.7			20.5	58.7
Max Q Clear Time (g_c+I1), s		11.8			23.0	62.0
Green Ext Time (p_c), s		5.5			0.0	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			90.3			
HCM 6th LOS			F			










# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	517	1506	0	0	1846	1170	574	10	220	0	0	0
Future Volume (veh/h)	517	1506	0	0	1846	1170	574	10	220	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	562	1637	0	0	2041	1015	632	0	192			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	405	3577	0	0	2022	857	779	0	347			
Arrive On Green	0.12	0.69	0.00	0.00	0.54	0.54	0.22	0.00	0.22			
Sat Flow, veh/h	3483	5316	0	0	3770	1598	3534	0	1572			
Grp Volume(v), veh/h	562	1637	0	0	2041	1015	632	0	192			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	11.0	13.5	0.0	0.0	50.7	50.7	16.0	0.0	10.3			
Cycle Q Clear(g_c), s	11.0	13.5	0.0	0.0	50.7	50.7	16.0	0.0	10.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	405	3577	0	0	2022	857	779	0	347			
V/C Ratio(X)	1.39	0.46	0.00	0.00	1.01	1.18	0.81	0.00	0.55			
Avail Cap(c_a), veh/h	405	3577	0	0	2022	857	1731	0	770			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	41.8	6.5	0.0	0.0	21.9	21.9	35.0	0.0	32.7			
Incr Delay (d2), s/veh	188.7	0.0	0.0	0.0	22.3	94.9	0.8	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/lt	5.1	3.6	0.0	0.0	25.1	38.5	6.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	230.5	6.5	0.0	0.0	44.3	116.8	35.8	0.0	33.2			
LnGrp LOS	F	A	A	A	F	F	D	A	C			
Approach Vol, veh/h	2199			3056			824					
Approach Delay, s/veh	63.7			68.4			35.2					
Approach LOS	E			E			D					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	69.7			24.8		15.0	54.7					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	64.4			45.0		11.0	49.4					
Max Q Clear Time (g_c+l1), s	15.5			18.0		13.0	52.7					
Green Ext Time (p_c), s	9.7			1.5		0.0	0.0					

### Intersection Summary

HCM 6th Ctrl Delay 62.2




HCM 6th LOS E

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Cumulative Plus Project AM Peak Hour

Intersection						
Int Delay, s/veh	203.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	120	535	54	50	510	130
Future Vol, veh/h	120	535	54	50	510	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	130	582	59	54	554	141
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1335	86	0	0	113	0
Stage 1	86	-	-	-	-	-
Stage 2	1249	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	171	978	-	-	1489	-
Stage 1	942	-	-	-	-	-
Stage 2	273	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 102	978	-	-	1489	-
Mov Cap-2 Maneuver	~ 102	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	163	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s\$	426.9	0		7		
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	- 380	1489	-		
HCM Lane V/C Ratio	-	- 1.874	0.372	-		
HCM Control Delay (s)	-	-\$ 426.9	8.8	0		
HCM Lane LOS	-	- F	A	A		
HCM 95th %tile Q(veh)	-	- 47.2	1.8	-		
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

# HCM 6th Signalized Intersection Summary

## 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Cumulative Plus Project AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←←	→→	←←←	→	←	→→
Traffic Volume (veh/h)	340	1485	948	100	480	910
Future Volume (veh/h)	340	1485	948	100	480	910
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1870	1870	1796	1796
Adj Flow Rate, veh/h	370	1614	1030	0	522	605
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	2	2	7	7
Cap, veh/h	419	1728	1695		783	1226
Arrive On Green	0.12	0.48	0.33	0.00	0.46	0.46
Sat Flow, veh/h	3483	3676	5274	1585	1711	2679
Grp Volume(v), veh/h	370	1614	1030	0	522	605
Grp Sat Flow(s),veh/h/ln	1742	1791	1702	1585	1711	1340
Q Serve(g_s), s	15.7	63.7	25.3	0.0	35.7	23.7
Cycle Q Clear(g_c), s	15.7	63.7	25.3	0.0	35.7	23.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	419	1728	1695		783	1226
V/C Ratio(X)	0.88	0.93	0.61		0.67	0.49
Avail Cap(c_a), veh/h	546	1898	1753		783	1226
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	64.9	36.6	41.9	0.0	31.8	28.5
Incr Delay (d2), s/veh	10.9	8.4	0.4	0.0	1.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	28.5	10.5	0.0	15.2	19.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	75.8	44.9	42.3	0.0	33.5	28.6
LnGrp LOS	E	D	D		C	C
Approach Vol, veh/h		1984	1030	A	1127	
Approach Delay, s/veh		50.7	42.3		30.9	
Approach LOS		D	D		C	
Timer - Assigned Phs				4	6	7
Phs Duration (G+Y+Rc), s				76.9	73.1	22.6
Change Period (Y+Rc), s				4.5	4.5	4.5
Max Green Setting (Gmax), s				79.5	61.5	23.5
Max Q Clear Time (g_c+I1), s				65.7	37.7	17.7
Green Ext Time (p_c), s				6.7	2.4	0.4

### Intersection Summary

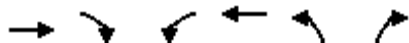
HCM 6th Ctrl Delay	43.2
HCM 6th LOS	D

### Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Cumulative Plus Project AM Peak Hour














Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑	↘↘	↗
Traffic Volume (veh/h)	1230	735	0	1664	154	30
Future Volume (veh/h)	1230	735	0	1664	154	30
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1337	599	0	1809	167	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	2090	932	0	2090	1239	568
Arrive On Green	0.59	0.59	0.00	0.59	0.36	0.36
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1337	599	0	1809	167	4
Grp Sat Flow(s),veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	37.3	37.5	0.0	64.0	4.9	0.2
Cycle Q Clear(g_c), s	37.3	37.5	0.0	64.0	4.9	0.2
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2090	932	0	2090	1239	568
V/C Ratio(X)	0.64	0.64	0.00	0.87	0.13	0.01
Avail Cap(c_a), veh/h	2748	1226	0	2748	1239	568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.4	20.4	0.0	25.9	32.4	30.9
Incr Delay (d2), s/veh	0.3	0.7	0.0	2.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	13.9	0.0	25.8	2.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.7	21.2	0.0	28.4	32.7	31.0
LnGrp LOS	C	C	A	C	C	C
Approach Vol, veh/h	1936			1809	171	
Approach Delay, s/veh	20.9			28.4	32.6	
Approach LOS	C			C	C	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	57.8		92.2		92.2	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	25.5		115.5		115.5	
Max Q Clear Time (g_c+I1), s	6.9		39.5		66.0	
Green Ext Time (p_c), s	0.5		22.7		21.7	
Intersection Summary						
HCM 6th Ctrl Delay			24.8			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Cumulative Plus Project AM Peak Hour





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	273	60	60	20	50	20	30	459	20	20	304	161
Future Volume (veh/h)	273	60	60	20	50	20	30	459	20	20	304	161
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	297	65	65	22	54	22	33	499	22	22	330	175
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	448	380	72	169	69	93	900	401	72	859	383
Arrive On Green	0.15	0.24	0.24	0.04	0.13	0.12	0.05	0.25	0.25	0.04	0.24	0.24
Sat Flow, veh/h	1781	1870	1585	1781	1263	515	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	297	65	65	22	0	76	33	499	22	22	330	175
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1778	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.5	1.0	1.2	0.5	0.0	1.5	0.7	4.6	0.4	0.5	2.9	3.5
Cycle Q Clear(g_c), s	5.5	1.0	1.2	0.5	0.0	1.5	0.7	4.6	0.4	0.5	2.9	3.5
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	448	380	72	0	238	93	900	401	72	859	383
V/C Ratio(X)	1.14	0.14	0.17	0.30	0.00	0.32	0.36	0.55	0.05	0.30	0.38	0.46
Avail Cap(c_a), veh/h	261	921	780	261	0	875	261	1844	822	261	1844	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	11.3	11.3	17.5	0.0	14.8	17.2	12.2	10.6	17.5	11.9	12.1
Incr Delay (d2), s/veh	98.6	0.1	0.2	2.3	0.0	0.8	2.3	0.5	0.1	2.3	0.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.4	0.4	0.2	0.0	0.5	0.3	1.3	0.1	0.2	0.8	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	114.6	11.4	11.5	19.8	0.0	15.6	19.5	12.7	10.7	19.8	12.2	13.0
LnGrp LOS	F	B	B	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	427		98			554			527			
Approach Delay, s/veh	83.2		16.5			13.0			12.8			
Approach LOS	F		B			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.5	13.5	5.5	13.0	6.0	13.1	9.5	9.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+I12.5	6.6	6.6	2.5	3.2	2.7	5.5	7.5	3.5				
Green Ext Time (p_c), s	0.0	2.4	0.0	0.4	0.0	2.1	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay			31.8									
HCM 6th LOS			C									

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Cumulative Plus Project PM Peak Hour









												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	240	10	290	1010	1171	0	0	822	580
Future Volume (veh/h)	0	0	0	240	10	290	1010	1171	0	0	822	580
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	1885	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				261	11	256	1098	1273	0	0	893	630
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				1	1	1	1	1	0	0	1	1
Cap, veh/h				668	0	306	1181	2636	0	0	2341	576
Arrive On Green				0.19	0.19	0.19	0.34	0.74	0.00	0.00	0.36	0.36
Sat Flow, veh/h				3483	0	1598	3483	3676	0	0	6749	1595
Grp Volume(v), veh/h				261	0	256	1098	1273	0	0	893	630
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1742	1791	0	0	1621	1595
Q Serve(g_s), s				7.3	0.0	17.1	33.7	16.1	0.0	0.0	11.3	40.0
Cycle Q Clear(g_c), s				7.3	0.0	17.1	33.7	16.1	0.0	0.0	11.3	40.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				668	0	306	1181	2636	0	0	2341	576
V/C Ratio(X)				0.39	0.00	0.84	0.93	0.48	0.00	0.00	0.38	1.09
Avail Cap(c_a), veh/h				1352	0	620	1415	2877	0	0	2341	576
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				39.1	0.0	43.1	35.4	6.0	0.0	0.0	26.2	35.4
Incr Delay (d2), s/veh				0.1	0.0	2.3	9.2	0.1	0.0	0.0	0.0	65.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.0	0.0	6.7	15.0	4.5	0.0	0.0	4.2	25.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				39.3	0.0	45.4	44.6	6.0	0.0	0.0	26.3	101.2
LnGrp LOS				D	A	D	D	A	A	A	C	F
Approach Vol, veh/h					517			2371			1523	
Approach Delay, s/veh					42.3			23.9			57.3	
Approach LOS					D			C			E	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	85.6			41.6			44.0			25.2		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	18.1			35.7			42.0			19.1		
Green Ext Time (p_c), s	6.8			1.8			0.0			0.9		
Intersection Summary												
HCM 6th Ctrl Delay	37.6											
HCM 6th LOS	D											

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  				
Traffic Volume (veh/h)	490	10	1082	0	0	0	0	1691	320	290	772	0
Future Volume (veh/h)	490	10	1082	0	0	0	0	1691	320	290	772	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	533	0	1183				0	1838	320	315	839	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1612	0	1435				0	1759	306	387	1625	0
Arrive On Green	0.45	0.00	0.45				0.00	0.31	0.30	0.11	0.45	0.00
Sat Flow, veh/h	3591	0	3195				0	5861	973	3483	3676	0
Grp Volume(v), veh/h	533	0	1183				0	1597	561	315	839	0
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1621	1707	1742	1791	0
Q Serve(g_s), s	9.2	0.0	30.9				0.0	30.0	30.0	8.4	16.0	0.0
Cycle Q Clear(g_c), s	9.2	0.0	30.9				0.0	30.0	30.0	8.4	16.0	0.0
Prop In Lane	1.00		1.00				0.00		0.57	1.00		0.00
Lane Grp Cap(c), veh/h	1612	0	1435				0	1528	536	387	1625	0
V/C Ratio(X)	0.33	0.00	0.82				0.00	1.05	1.05	0.81	0.52	0.00
Avail Cap(c_a), veh/h	3197	0	2845				0	1528	536	474	1763	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.0	0.0	23.0				0.0	32.7	33.1	41.5	18.6	0.0
Incr Delay (d2), s/veh	0.1	0.0	1.3				0.0	35.8	51.5	7.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	10.6				0.0	15.9	19.2	3.8	6.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	0.0	24.3				0.0	68.5	84.6	48.7	18.7	0.0
LnGrp LOS	B	A	C				A	F	F	D	B	A
Approach Vol, veh/h	1716						2158			1154		
Approach Delay, s/veh	22.1						72.7			26.9		
Approach LOS	C						E			C		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	4.6	34.0	46.9		48.6							
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	3.0	28.7	84.5		* 47							
Max Q Clear Time (g_c+I10), s	4.0	32.0	32.9		18.0							
Green Ext Time (p_c), s	0.2	0.0	9.4		3.6							

### Intersection Summary

HCM 6th Ctrl Delay 44.9  
HCM 6th LOS D

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



















# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	  		 	
Traffic Volume (veh/h)	50	30	130	1024	120	210	460	700	1280	70	720	40
Future Volume (veh/h)	50	30	130	1024	120	210	460	700	1280	70	720	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	33	8	1113	130	177	500	761	609	76	783	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	76	18	1139	172	235	464	1756	1360	81	959	49
Arrive On Green	0.04	0.05	0.05	0.23	0.24	0.23	0.26	0.49	0.49	0.05	0.28	0.27
Sat Flow, veh/h	1781	1449	351	5023	718	977	1781	3554	2753	1781	3440	176
Grp Volume(v), veh/h	54	0	41	1113	0	307	500	761	609	76	404	419
Grp Sat Flow(s),veh/h/ln	1781	0	1800	1674	0	1695	1781	1777	1377	1781	1777	1839
Q Serve(g_s), s	2.7	0.0	2.0	19.4	0.0	14.9	23.0	12.2	12.7	3.8	18.7	18.8
Cycle Q Clear(g_c), s	2.7	0.0	2.0	19.4	0.0	14.9	23.0	12.2	12.7	3.8	18.7	18.8
Prop In Lane	1.00		0.20	1.00		0.58	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	69	0	95	1139	0	407	464	1756	1360	81	495	513
V/C Ratio(X)	0.78	0.00	0.43	0.98	0.00	0.75	1.08	0.43	0.45	0.94	0.82	0.82
Avail Cap(c_a), veh/h	202	0	673	1139	0	826	464	2699	2091	81	967	1000
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	0.0	40.6	33.9	0.0	31.3	32.6	14.4	14.5	42.0	29.7	29.8
Incr Delay (d2), s/veh	7.0	0.0	1.2	21.2	0.0	1.1	63.9	0.1	0.1	79.4	1.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.9	9.6	0.0	5.8	17.4	4.3	3.5	3.4	7.6	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.0	0.0	41.7	55.1	0.0	32.3	96.6	14.4	14.6	121.4	31.0	31.0
LnGrp LOS	D	A	D	E	A	C	F	B	B	F	C	C
Approach Vol, veh/h	95			1420			1870			899		
Approach Delay, s/veh	45.9			50.2			36.4			38.6		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	47.6	24.0	8.6	27.0	28.6	7.4	25.2				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	66.1	20.0	32.4	23.0	47.1	10.0	42.4				
Max Q Clear Time (g_c+15), s	4.0	14.7	21.4	4.0	25.0	20.8	4.7	16.9				
Green Ext Time (p_c), s	0.0	5.1	0.0	0.1	0.0	2.9	0.0	1.1				

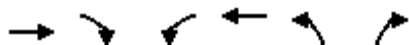
### Intersection Summary

HCM 6th Ctrl Delay	41.7
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Cumulative Plus Project PM Peak Hour








Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	560	820	230	690	664	160
Future Volume (veh/h)	560	820	230	690	664	160
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	609	314	250	750	722	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	1111	492	424	990	922	423
Arrive On Green	0.32	0.32	0.12	0.54	0.27	0.27
Sat Flow, veh/h	3589	1548	3401	1841	3401	1560
Grp Volume(v), veh/h	609	314	250	750	722	38
Grp Sat Flow(s), veh/h/ln	1749	1548	1700	1841	1700	1560
Q Serve(g_s), s	6.0	7.3	2.9	13.3	8.2	0.8
Cycle Q Clear(g_c), s	6.0	7.3	2.9	13.3	8.2	0.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1111	492	424	990	922	423
V/C Ratio(X)	0.55	0.64	0.59	0.76	0.78	0.09
Avail Cap(c_a), veh/h	2922	1293	455	1960	1413	648
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.8	12.2	17.3	7.5	14.1	11.4
Incr Delay (d2), s/veh	0.2	0.5	1.8	0.5	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	1.8	1.0	2.4	2.7	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.0	12.7	19.1	8.0	14.8	11.4
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	923			1000	760	
Approach Delay, s/veh	12.2			10.8	14.7	
Approach LOS	B			B	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		15.4	9.2	17.3		26.5
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		17.4	5.1	34.4		44.0
Max Q Clear Time (g_c+I1), s		10.2	4.9	9.3		15.3
Green Ext Time (p_c), s		1.1	0.0	3.0		3.1
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			12.4			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	540	40	2416	0	0	0	0	1900	478	470	1030	0
Future Volume (veh/h)	540	40	2416	0	0	0	0	1900	478	470	1030	0
Initial Q (Qb), veh	0	0	20				0	20	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	587	43	2523				0	2065	494	511	1120	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1384	0	1448				0	2048	137	321	2809	0
Arrive On Green	0.40	0.40	0.40				0.00	0.42	0.41	0.09	0.55	0.00
Sat Flow, veh/h	3483	0	3643				0	4876	978	3483	5316	0
Grp Volume(v), veh/h	587	0	2523				0	1697	862	511	1120	0
Grp Sat Flow(s),veh/h/ln	1742	0	1214				0	1131	1707	1742	1716	0
Q Serve(g_s), s	17.2	0.0	56.0				0.0	59.0	59.0	13.0	17.8	0.0
Cycle Q Clear(g_c), s	17.2	0.0	56.0				0.0	59.0	59.0	13.0	17.8	0.0
Prop In Lane	1.00		1.00				0.00		0.57	1.00		0.00
Lane Grp Cap(c), veh/h	1384	0	1448				0	1421	764	321	2809	0
V/C Ratio(X)	0.42	0.00	1.74				0.00	1.19	1.13	1.59	0.40	0.00
Avail Cap(c_a), veh/h	1384	0	1448				0	1421	715	321	2809	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.8	0.0	42.4				0.0	40.9	41.0	63.9	18.6	0.0
Incr Delay (d2), s/veh	0.1	0.0	337.1				0.0	94.7	73.6	279.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	49.7				0.0	38.0	23.6	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.0	67.9				0.0	33.1	45.9	18.1	6.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	0.0	429.3				0.0	173.7	138.2	343.8	18.6	0.0
LnGrp LOS	C	A	F				A	F	F	F	B	A
Approach Vol, veh/h	3110						2559			1631		
Approach Delay, s/veh	354.1						161.7			120.5		
Approach LOS	F						F			F		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	7.9	63.0	60.0	80.9								
Change Period (Y+Rc), s	4.9	* 4.9	5.3	4.9								
Max Green Setting (Gmax), s	58.0	* 58	54.7	75.1								
Max Q Clear Time (g_c+I1), s	61.0	61.0	58.0	19.8								
Green Ext Time (p_c), s	0.0	0.0	0.0	5.5								

### Intersection Summary

HCM 6th Ctrl Delay 234.5

HCM 6th LOS F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Contra Loma Plaza/Davison Drive

The Ranch  
Cumulative Plus Project PM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↱	↰	↱		↰	↱	↱
Traffic Volume (veh/h)	70	60	80	180	40	150	80	1071	160	220	1334	30
Future Volume (veh/h)	70	60	80	180	40	150	80	1071	160	220	1334	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	76	65	5	196	43	17	87	1164	166	239	1450	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	116	99	185	258	271	229	113	1433	204	326	1744	38
Arrive On Green	0.12	0.12	0.12	0.14	0.14	0.14	0.06	0.46	0.45	0.09	0.49	0.48
Sat Flow, veh/h	989	846	1577	1795	1885	1594	1795	3142	447	3483	3583	79
Grp Volume(v), veh/h	141	0	5	196	43	17	87	662	668	239	724	758
Grp Sat Flow(s), veh/h/ln	1836	0	1577	1795	1885	1594	1795	1791	1798	1742	1791	1871
Q Serve(g_s), s	6.2	0.0	0.2	8.8	1.7	0.8	4.0	26.9	27.2	5.6	29.4	29.5
Cycle Q Clear(g_c), s	6.2	0.0	0.2	8.8	1.7	0.8	4.0	26.9	27.2	5.6	29.4	29.5
Prop In Lane	0.54		1.00	1.00		1.00	1.00		0.25	1.00		0.04
Lane Grp Cap(c), veh/h	215	0	185	258	271	229	113	817	820	326	872	911
V/C Ratio(X)	0.66	0.00	0.03	0.76	0.16	0.07	0.77	0.81	0.82	0.73	0.83	0.83
Avail Cap(c_a), veh/h	762	0	655	809	850	719	341	1593	1600	661	1593	1664
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	0.0	33.0	34.7	31.6	31.3	38.9	19.8	19.9	37.2	18.6	18.7
Incr Delay (d2), s/veh	1.3	0.0	0.0	1.8	0.1	0.1	4.2	0.7	0.8	1.2	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	0.1	3.8	0.7	0.3	1.8	9.8	10.0	2.4	11.3	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.9	0.0	33.0	36.5	31.7	31.3	43.1	20.5	20.7	38.4	19.4	19.5
LnGrp LOS	D	A	C	D	C	C	D	C	C	D	B	B
Approach Vol, veh/h	146			256			1417			1721		
Approach Delay, s/veh	36.7			35.3			22.0			22.1		
Approach LOS	D			D			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	42.4		13.9	9.3	45.0		16.1				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+11), s	6	29.2		8.2	6.0	31.5		10.8				
Green Ext Time (p_c), s	0.3	6.1		0.4	0.1	9.0		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				23.6								
HCM 6th LOS				C								

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	220	110	80	130	740	140	858	70	1060	1380	230
Future Volume (veh/h)	170	220	110	80	130	740	140	858	70	1060	1380	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	185	239	74	87	141	804	152	933	73	1152	1500	185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	207	835	252	107	904	1271	130	1089	85	709	1599	875
Arrive On Green	0.12	0.31	0.30	0.06	0.25	0.25	0.07	0.32	0.32	0.20	0.45	0.44
Sat Flow, veh/h	1795	2710	819	1795	3582	2812	1795	3364	263	3483	3582	1577
Grp Volume(v), veh/h	185	156	157	87	141	804	152	497	509	1152	1500	185
Grp Sat Flow(s),veh/h/ln	1795	1791	1738	1795	1791	1406	1795	1791	1837	1742	1791	1577
Q Serve(g_s), s	15.5	10.1	10.5	7.3	4.7	33.4	11.0	39.5	39.5	31.0	60.7	5.6
Cycle Q Clear(g_c), s	15.5	10.1	10.5	7.3	4.7	33.4	11.0	39.5	39.5	31.0	60.7	5.6
Prop In Lane	1.00		0.47	1.00		1.00	1.00		0.14	1.00		1.00
Lane Grp Cap(c), veh/h	207	552	535	107	904	1271	130	580	594	709	1599	875
V/C Ratio(X)	0.89	0.28	0.29	0.81	0.16	0.63	1.17	0.86	0.86	1.62	0.94	0.21
Avail Cap(c_a), veh/h	259	847	822	130	1435	1688	130	588	603	709	1647	896
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.4	39.9	40.2	70.8	44.3	32.0	70.6	48.2	48.3	60.6	40.1	7.7
Incr Delay (d2), s/veh	23.2	0.1	0.1	22.8	0.0	0.2	132.5	11.3	11.0	287.5	10.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	4.4	4.5	4.0	2.1	11.1	9.8	19.0	19.5	42.0	28.8	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	89.6	40.0	40.3	93.5	44.3	32.2	203.2	59.5	59.3	348.1	50.5	7.7
LnGrp LOS	F	D	D	F	D	C	F	E	E	F	D	A
Approach Vol, veh/h	498			1032			1158			2837		
Approach Delay, s/veh	58.5			39.0			78.3			168.5		
Approach LOS	E			D			E			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	35.0	53.3	13.1	50.9	16.3	72.0	21.6	42.4				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	31.0	48.7	11.0	71.4	11.0	* 69	22.0	60.4				
Max Q Clear Time (g_c+3.0), s	33.0	41.5	9.3	12.5	13.0	62.7	17.5	35.4				
Green Ext Time (p_c), s	0.0	2.4	0.0	1.0	0.0	4.0	0.1	2.4				

### Intersection Summary

HCM 6th Ctrl Delay 115.5

HCM 6th LOS F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	90	902	10	60	70	641	1061	20	80	1284	200
Future Volume (veh/h)	170	90	902	10	60	70	641	1061	20	80	1284	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	137	154	135	11	63	6	675	1117	10	84	1352	194
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	224	235	398	15	88	88	781	1992	867	108	1740	250
Arrive On Green	0.12	0.12	0.12	0.06	0.06	0.06	0.22	0.56	0.56	0.06	0.38	0.38
Sat Flow, veh/h	1795	1885	3195	278	1593	1598	3483	3582	1558	1795	4538	651
Grp Volume(v), veh/h	137	154	135	74	0	6	675	1117	10	84	1022	524
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1871	0	1598	1742	1791	1558	1795	1716	1758
Q Serve(g_s), s	5.7	6.1	3.0	3.1	0.0	0.3	14.7	15.8	0.2	3.6	20.6	20.6
Cycle Q Clear(g_c), s	5.7	6.1	3.0	3.1	0.0	0.3	14.7	15.8	0.2	3.6	20.6	20.6
Prop In Lane	1.00		1.00	0.15		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	224	235	398	103	0	88	781	1992	867	108	1315	674
V/C Ratio(X)	0.61	0.66	0.34	0.72	0.00	0.07	0.86	0.56	0.01	0.77	0.78	0.78
Avail Cap(c_a), veh/h	502	527	894	928	0	792	1107	2459	1070	205	1658	849
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.6	32.8	31.5	36.5	0.0	35.2	29.3	11.3	7.8	36.4	21.3	21.4
Incr Delay (d2), s/veh	1.0	1.2	0.2	3.4	0.0	0.1	3.9	0.1	0.0	4.4	1.4	2.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	2.4	2.7	1.1	1.4	0.0	0.1	6.0	5.0	0.1	1.7	7.9	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	33.6	34.0	31.6	40.0	0.0	35.3	33.2	11.3	7.8	40.8	22.7	24.1
LnGrp LOS	C	C	C	D	A	D	C	B	A	D	C	C
Approach Vol, veh/h	426			80			1802			1630		
Approach Delay, s/veh	33.1			39.6			19.5			24.1		
Approach LOS	C			D			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	47.7		13.8	21.6	34.9		8.3				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	21.0	52.7		21.1	25.0	* 37		39.0				
Max Q Clear Time (g_c+15), s	17.8	17.8		8.1	16.7	22.6		5.1				
Green Ext Time (p_c), s	0.0	5.4		0.8	1.0	6.8		0.2				

### Intersection Summary

HCM 6th Ctrl Delay 23.3

HCM 6th LOS C

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱ ↱ ↱			↰ ↱ ↱ ↱			↰ ↱		↱	↰ ↱		↱
Traffic Volume (veh/h)	110	1269	438	117	1022	50	312	61	81	50	41	90
Future Volume (veh/h)	110	1269	438	117	1022	50	312	61	81	50	41	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	120	1379	408	127	1111	21	339	66	-34	54	45	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	154	1781	524	173	2411	46	435	377	319	69	142	60
Arrive On Green	0.09	0.45	0.45	0.10	0.46	0.46	0.12	0.20	0.00	0.04	0.11	0.10
Sat Flow, veh/h	1795	3933	1158	1795	5198	98	3483	1885	1598	1795	1254	530
Grp Volume(v), veh/h	120	1202	585	127	733	399	339	66	-34	54	0	64
Grp Sat Flow(s),veh/h/ln	1795	1716	1660	1795	1716	1865	1742	1885	1598	1795	0	1784
Q Serve(g_s), s	4.9	22.2	22.5	5.2	11.0	11.0	7.1	2.2	0.0	2.2	0.0	2.5
Cycle Q Clear(g_c), s	4.9	22.2	22.5	5.2	11.0	11.0	7.1	2.2	0.0	2.2	0.0	2.5
Prop In Lane	1.00		0.70	1.00		0.05	1.00		1.00	1.00		0.30
Lane Grp Cap(c), veh/h	154	1554	752	173	1592	865	435	377	319	69	0	202
V/C Ratio(X)	0.78	0.77	0.78	0.73	0.46	0.46	0.78	0.18	-0.11	0.79	0.00	0.32
Avail Cap(c_a), veh/h	405	2414	1167	405	2414	1312	647	1126	954	214	0	947
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.7	17.4	17.5	33.1	13.8	13.8	32.0	25.0	0.0	35.9	0.0	30.9
Incr Delay (d2), s/veh	3.2	0.3	0.7	2.2	0.1	0.1	1.8	0.1	0.0	7.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	7.4	7.3	2.2	3.6	3.9	2.9	0.9	0.0	1.1	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	17.7	18.2	35.3	13.8	13.9	33.7	25.1	0.0	43.1	0.0	31.2
LnGrp LOS	D	B	B	D	B	B	C	C	A	D	A	C
Approach Vol, veh/h	1907		1259			371			118			
Approach Delay, s/veh	19.0		16.0			35.3			36.7			
Approach LOS	B		B			D			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.9	19.1	11.3	38.1	13.4	12.5	10.5	38.9				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	4.0	43.7	17.0	* 53	14.0	38.7	17.0	* 53				
Max Q Clear Time (g_c+14.2), s	4.2	4.2	7.2	24.5	9.1	4.5	6.9	13.0				
Green Ext Time (p_c), s	0.0	0.2	0.1	9.5	0.3	0.2	0.1	4.9				

### Intersection Summary

HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

### Notes





















\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Cumulative Plus Project PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	891	442	286	900	270	362	481	283	380	406	40
Future Volume (veh/h)	100	891	442	286	900	270	362	481	283	380	406	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	109	968	203	311	978	102	393	523	248	413	441	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	134	1204	252	338	1882	196	411	627	296	465	949	77
Arrive On Green	0.07	0.28	0.27	0.19	0.39	0.38	0.12	0.27	0.25	0.13	0.28	0.27
Sat Flow, veh/h	1810	4273	893	1810	4772	497	3510	2365	1117	3510	3379	275
Grp Volume(v), veh/h	109	783	388	311	708	372	393	399	372	413	235	242
Grp Sat Flow(s),veh/h/ln	1810	1729	1708	1810	1729	1811	1755	1805	1677	1755	1805	1848
Q Serve(g_s), s	7.1	25.2	25.3	20.2	18.7	18.8	13.3	24.9	25.1	13.8	12.9	13.0
Cycle Q Clear(g_c), s	7.1	25.2	25.3	20.2	18.7	18.8	13.3	24.9	25.1	13.8	12.9	13.0
Prop In Lane	1.00		0.52	1.00		0.27	1.00		0.67	1.00		0.15
Lane Grp Cap(c), veh/h	134	975	481	338	1364	714	411	479	445	465	507	519
V/C Ratio(X)	0.81	0.80	0.81	0.92	0.52	0.52	0.96	0.83	0.84	0.89	0.46	0.47
Avail Cap(c_a), veh/h	166	1213	599	378	1618	847	411	618	574	469	648	664
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	39.9	40.3	47.8	27.6	27.8	52.6	41.5	42.0	51.0	35.6	35.7
Incr Delay (d2), s/veh	17.6	2.5	5.2	24.7	0.1	0.2	33.2	6.0	6.7	17.7	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	10.6	11.0	11.1	7.4	7.8	7.6	11.5	10.9	7.1	5.5	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.2	42.4	45.5	72.5	27.7	28.0	85.8	47.5	48.7	68.7	35.8	36.0
LnGrp LOS	E	D	D	E	C	C	F	D	D	E	D	D
Approach Vol, veh/h	1280			1391			1164			890		
Approach Delay, s/veh	45.9			37.8			60.8			51.1		
Approach LOS	D			D			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.9	35.8	26.3	37.7	18.0	37.6	12.9	51.2				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7				
Max Q Clear Time (g_c+I1), s	15.8	27.1	22.2	27.3	15.3	15.0	9.1	20.8				
Green Ext Time (p_c), s	0.0	2.4	0.1	4.2	0.0	1.5	0.0	4.6				
Intersection Summary												
HCM 6th Ctrl Delay	48.2											
HCM 6th LOS	D											

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱ ↲ ↳			↰ ↱ ↲ ↳		↰ ↱	↰ ↱ ↳			↰ ↱ ↲ ↳		↰ ↱ ↲ ↱
Traffic Volume (veh/h)	336	1402	170	220	1200	320	270	421	320	510	354	145
Future Volume (veh/h)	336	1402	170	220	1200	320	270	421	320	510	354	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	365	1524	120	239	1304	143	293	458	233	554	385	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	287	1815	143	196	1662	508	226	590	298	439	920	402
Arrive On Green	0.16	0.37	0.36	0.11	0.32	0.32	0.13	0.26	0.25	0.13	0.26	0.26
Sat Flow, veh/h	1795	4863	383	1795	5147	1574	1795	2298	1160	3483	3582	1566
Grp Volume(v), veh/h	365	1075	569	239	1304	143	293	356	335	554	385	34
Grp Sat Flow(s),veh/h/ln	1795	1716	1815	1795	1716	1574	1795	1791	1668	1742	1791	1566
Q Serve(g_s), s	19.0	34.0	34.1	13.0	27.3	8.0	15.0	21.9	22.3	15.0	10.6	2.0
Cycle Q Clear(g_c), s	19.0	34.0	34.1	13.0	27.3	8.0	15.0	21.9	22.3	15.0	10.6	2.0
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.70	1.00		1.00
Lane Grp Cap(c), veh/h	287	1281	678	196	1662	508	226	460	428	439	920	402
V/C Ratio(X)	1.27	0.84	0.84	1.22	0.78	0.28	1.29	0.77	0.78	1.26	0.42	0.08
Avail Cap(c_a), veh/h	287	1615	854	196	2163	662	226	677	631	439	1355	592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.0	34.0	34.2	53.0	36.5	30.0	52.0	41.0	41.5	52.0	36.8	33.6
Incr Delay (d2), s/veh	147.2	2.7	5.0	135.4	1.1	0.1	161.2	1.7	2.0	134.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.0	13.9	15.2	13.1	11.1	3.0	16.7	9.5	9.1	14.6	4.5	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	197.2	36.7	39.2	188.3	37.6	30.1	213.2	42.7	43.6	186.9	36.9	33.6
LnGrp LOS	F	D	D	F	D	C	F	D	D	F	D	C
Approach Vol, veh/h	2009				1686				984		973	
Approach Delay, s/veh	66.6				58.3				93.7		122.2	
Approach LOS	E				E				F		F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	49.0	34.6	17.0	48.4	19.0	34.6	23.0	42.4				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	45.0	43.7	13.0	54.7	15.0	43.7	19.0	48.7				
Max Q Clear Time (g_c+I1), s	117.0	24.3	15.0	36.1	17.0	12.6	21.0	29.3				
Green Ext Time (p_c), s	0.0	2.4	0.0	7.0	0.0	1.5	0.0	6.1				

### Intersection Summary

HCM 6th Ctrl Delay	78.4
HCM 6th LOS	E

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	2610	1200	430	1926	0	0	0	0	880	10	850
Future Volume (veh/h)	0	2610	1200	430	1926	0	0	0	0	880	10	850
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	2747	942	453	2027	0				934	0	858
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2559	781	358	3631	0				893	0	397
Arrive On Green	0.00	0.49	0.49	0.18	0.70	0.00				0.25	0.00	0.25
Sat Flow, veh/h	0	5358	1582	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	2747	942	453	2027	0				934	0	858
Grp Sat Flow(s),veh/h/ln	0	1729	1582	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	74.0	74.0	27.0	28.9	0.0				37.0	0.0	37.0
Cycle Q Clear(g_c), s	0.0	74.0	74.0	27.0	28.9	0.0				37.0	0.0	37.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2559	781	358	3631	0				893	0	397
V/C Ratio(X)	0.00	1.07	1.21	1.26	0.56	0.00				1.05	0.00	2.16
Avail Cap(c_a), veh/h	0	2559	781	358	3631	0				893	0	397
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	38.0	38.0	61.5	11.1	0.0				56.5	0.0	56.5
Incr Delay (d2), s/veh	0.0	41.3	105.0	139.5	0.1	0.0				42.9	0.0	530.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	39.3	49.8	13.6	9.9	0.0				21.8	0.0	73.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	79.3	143.0	201.0	11.2	0.0				99.4	0.0	586.9
LnGrp LOS	A	F	F	F	B	A				F	A	F
Approach Vol, veh/h		3689			2480						1792	
Approach Delay, s/veh		95.6			45.9						332.8	
Approach LOS		F			D						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	31.0	78.0		41.0		109.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	27.0	72.7		35.7		103.7						
Max Q Clear Time (g_c+Q), s	29.0	76.0		39.0		30.9						
Green Ext Time (p_c), s	0.0	0.0		0.0		15.0						

### Intersection Summary

HCM 6th Ctrl Delay 133.5  
HCM 6th LOS F

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	2790	700	210	1346	730	1010	50	420	0	0	0
Future Volume (veh/h)	0	2790	700	210	1346	730	1010	50	420	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No		No			No					
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	0	2937	549	221	1417	456	1101	0	305			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	1	1	1	1	1	1	1	1			
Cap, veh/h	0	2280	696	182	2992	903	1238	0	551			
Arrive On Green	0.00	0.44	0.44	0.10	0.58	0.58	0.34	0.00	0.34			
Sat Flow, veh/h	0	5316	1572	1795	5147	1553	3591	0	1598			
Grp Volume(v), veh/h	0	2937	549	221	1417	456	1101	0	305			
Grp Sat Flow(s),veh/h/ln	0	1716	1572	1795	1716	1553	1795	0	1598			
Q Serve(g_s), s	0.0	48.0	32.4	11.0	17.2	18.9	31.4	0.0	16.8			
Cycle Q Clear(g_c), s	0.0	48.0	32.4	11.0	17.2	18.9	31.4	0.0	16.8			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2280	696	182	2992	903	1238	0	551			
V/C Ratio(X)	0.00	1.29	0.79	1.21	0.47	0.51	0.89	0.00	0.55			
Avail Cap(c_a), veh/h	0	2280	696	182	2992	903	1624	0	723			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	30.2	25.8	48.7	13.1	13.4	33.5	0.0	28.8			
Incr Delay (d2), s/veh	0.0	133.1	5.6	135.4	0.0	0.2	4.4	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	46.1	12.2	11.6	5.9	5.9	13.6	0.0	6.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	163.3	31.4	184.1	13.1	13.6	37.9	0.0	29.1			
LnGrp LOS	A	F	C	F	B	B	D	A	C			
Approach Vol, veh/h		3486			2094			1406				
Approach Delay, s/veh		142.5			31.3			36.0				
Approach LOS		F			C			D				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	52.0			41.3		67.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	46.7			47.7		61.7						
Max Q Clear Time (g_c+I1), s	50.0			33.4		20.9						
Green Ext Time (p_c), s	0.0	0.0		2.7		9.1						

### Intersection Summary

HCM 6th Ctrl Delay	87.7
HCM 6th LOS	F

### Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	160	5	24	50	175	21	184	28	440	616	170
Future Volume (veh/h)	110	160	5	24	50	175	21	184	28	440	616	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	120	174	5	26	54	80	23	200	10	478	670	151
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	192	252	7	150	79	117	150	490	24	546	1050	236
Arrive On Green	0.11	0.14	0.14	0.08	0.11	0.11	0.08	0.14	0.11	0.30	0.36	0.33
Sat Flow, veh/h	1795	1823	52	1795	686	1016	1795	3472	173	1795	2903	654
Grp Volume(v), veh/h	120	0	179	26	0	134	23	103	107	478	413	408
Grp Sat Flow(s),veh/h/ln	1795	0	1875	1795	0	1702	1795	1791	1854	1795	1791	1765
Q Serve(g_s), s	3.1	0.0	4.4	0.6	0.0	3.6	0.6	2.5	2.5	12.1	9.2	9.3
Cycle Q Clear(g_c), s	3.1	0.0	4.4	0.6	0.0	3.6	0.6	2.5	2.5	12.1	9.2	9.3
Prop In Lane	1.00		0.03	1.00		0.60	1.00		0.09	1.00		0.37
Lane Grp Cap(c), veh/h	192	0	259	150	0	195	150	253	262	546	648	639
V/C Ratio(X)	0.63	0.00	0.69	0.17	0.00	0.69	0.15	0.41	0.41	0.88	0.64	0.64
Avail Cap(c_a), veh/h	411	0	1406	411	0	1276	785	1902	1969	785	1902	1875
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	0.0	19.7	20.5	0.0	20.4	20.4	18.8	18.9	15.8	12.7	12.9
Incr Delay (d2), s/veh	1.2	0.0	1.2	0.2	0.0	1.6	0.2	0.4	0.4	5.9	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	1.7	0.2	0.0	1.3	0.2	0.9	0.9	4.6	2.7	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.8	0.0	20.9	20.7	0.0	22.0	20.6	19.2	19.2	21.7	13.1	13.3
LnGrp LOS	C	A	C	C	A	C	C	B	B	C	B	B
Approach Vol, veh/h	299			160			233			1299		
Approach Delay, s/veh	21.3			21.8			19.3			16.4		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.8	8.0	10.6	8.0	21.4	9.1	9.5					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	11.0	36.0	21.0	49.7	11.0	36.0					
Max Q Clear Time (g_c+I14, s)	4.5	2.6	6.4	2.6	11.3	5.1	5.6					
Green Ext Time (p_c), s	0.5	0.7	0.0	0.5	0.0	3.1	0.1	0.4				

## Intersection Summary









HCM 6th Ctrl Delay	17.9
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	150	85	33	120	100	185	655	165	310	615	110
Future Volume (veh/h)	100	150	85	33	120	100	185	655	165	310	615	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	109	163	74	36	130	77	201	712	153	337	668	102
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	141	245	111	53	167	99	249	934	201	385	1229	187
Arrive On Green	0.08	0.20	0.20	0.03	0.15	0.15	0.14	0.32	0.30	0.21	0.39	0.37
Sat Flow, veh/h	1810	1237	562	1810	1118	662	1810	2956	635	1810	3140	479
Grp Volume(v), veh/h	109	0	237	36	0	207	201	435	430	337	384	386
Grp Sat Flow(s),veh/h/ln	1810	0	1799	1810	0	1781	1810	1805	1786	1810	1805	1814
Q Serve(g_s), s	3.9	0.0	8.0	1.3	0.0	7.3	7.1	14.2	14.3	11.8	10.8	10.8
Cycle Q Clear(g_c), s	3.9	0.0	8.0	1.3	0.0	7.3	7.1	14.2	14.3	11.8	10.8	10.8
Prop In Lane	1.00		0.31	1.00		0.37	1.00		0.36	1.00		0.26
Lane Grp Cap(c), veh/h	141	0	356	53	0	265	249	570	564	385	706	710
V/C Ratio(X)	0.77	0.00	0.67	0.68	0.00	0.78	0.81	0.76	0.76	0.87	0.54	0.54
Avail Cap(c_a), veh/h	304	0	1016	276	0	978	525	1102	1090	470	1047	1052
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.6	0.0	24.3	31.5	0.0	26.8	27.4	20.2	20.4	24.9	15.4	15.6
Incr Delay (d2), s/veh	3.4	0.0	0.8	5.5	0.0	1.9	2.4	0.8	0.8	12.8	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	3.1	0.6	0.0	2.9	2.9	5.2	5.2	5.8	3.7	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	0.0	25.1	37.0	0.0	28.7	29.8	21.0	21.2	37.7	15.7	15.8
LnGrp LOS	C	A	C	D	A	C	C	C	C	D	B	B
Approach Vol, veh/h	346				243		1066				1107	
Approach Delay, s/veh	27.6				30.0		22.8				22.4	
Approach LOS	C				C		C				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	24.7	5.9	16.9	13.0	29.6	9.1	13.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	7.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0				
Max Q Clear Time (g_c+I1), s	13.8	16.3	3.3	10.0	9.1	12.8	5.9	9.3				
Green Ext Time (p_c), s	0.2	3.1	0.0	0.8	0.2	2.7	0.0	0.7				

### Intersection Summary










HCM 6th Ctrl Delay	23.9
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	0	8	160	0	330	18	776	40	100	603	125
Future Volume (veh/h)	45	0	8	160	0	330	18	776	40	100	603	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	0	1900	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	49	0	9	174	0	57	20	843	17	109	655	136
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	0	0	2	0	0	0	0	0
Cap, veh/h	358	0	129	0	0	0	539	1532	668	146	1913	397
Arrive On Green	0.08	0.00	0.06	0.00	0.00	0.00	0.42	0.42	0.42	0.08	0.64	0.60
Sat Flow, veh/h	1346	0	1585		0		685	3610	1575	1810	2977	617
Grp Volume(v), veh/h	49	0	9		0.0		20	843	17	109	397	394
Grp Sat Flow(s),veh/h/ln	1346	0	1585				685	1805	1575	1810	1805	1789
Q Serve(g_s), s	1.0	0.0	0.2				0.5	5.1	0.2	1.7	2.9	3.0
Cycle Q Clear(g_c), s	1.0	0.0	0.2				0.5	5.1	0.2	1.7	2.9	3.0
Prop In Lane	1.00		1.00				1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	358	0	129				539	1532	668	146	1160	1150
V/C Ratio(X)	0.14	0.00	0.07				0.04	0.55	0.03	0.75	0.34	0.34
Avail Cap(c_a), veh/h	1107	0	1011				1217	5101	2225	2058	4852	4809
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	0.0	12.5				5.0	6.3	4.9	13.0	2.4	2.5
Incr Delay (d2), s/veh	0.2	0.0	0.2				0.0	0.1	0.0	2.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0				0.0	0.6	0.0	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	0.0	12.8				5.0	6.4	4.9	15.9	2.4	2.6
LnGrp LOS	B	A	B				A	A	A	B	A	A
Approach Vol, veh/h	58						880			900		
Approach Delay, s/veh	12.9						6.3			4.1		
Approach LOS	B						A			A		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	6.3	16.3	6.4		22.6							
Change Period (Y+Rc), s	4.0	5.3	4.5		5.3							
Max Green Setting (Gmax), s	33.0	39.7	18.0		76.7							
Max Q Clear Time (g_c+I1), s	13.3	7.1	3.0		5.0							
Green Ext Time (p_c), s	0.1	3.9	0.1		2.9							
Intersection Summary												
HCM 6th Ctrl Delay	5.5											
HCM 6th LOS	A											



# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	137	32	130	278	418	51	599	80	370	358	34
Future Volume (veh/h)	80	137	32	130	278	418	51	599	80	370	358	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	84	144	34	137	293	123	54	631	77	389	377	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	313	473	401	398	622	255	80	987	120	581	1419	135
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.04	0.30	0.27	0.17	0.43	0.40
Sat Flow, veh/h	986	1900	1610	1225	2497	1024	1810	3239	395	3510	3332	316
Grp Volume(v), veh/h	84	144	34	137	210	206	54	351	357	389	203	210
Grp Sat Flow(s),veh/h/ln	986	1900	1610	1225	1805	1716	1810	1805	1829	1755	1805	1843
Q Serve(g_s), s	3.4	2.6	0.7	4.4	4.2	4.4	1.3	7.2	7.2	4.4	3.1	3.2
Cycle Q Clear(g_c), s	7.8	2.6	0.7	7.0	4.2	4.4	1.3	7.2	7.2	4.4	3.1	3.2
Prop In Lane	1.00		1.00	1.00		0.60	1.00		0.22	1.00		0.17
Lane Grp Cap(c), veh/h	313	473	401	398	449	427	80	550	557	581	769	785
V/C Ratio(X)	0.27	0.30	0.08	0.34	0.47	0.48	0.67	0.64	0.64	0.67	0.26	0.27
Avail Cap(c_a), veh/h	1729	3202	2714	2159	3042	2892	508	1775	1798	1972	2282	2330
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	13.0	12.3	15.9	13.6	13.7	20.1	12.8	13.0	16.7	7.9	8.0
Incr Delay (d2), s/veh	0.2	0.1	0.0	0.2	0.3	0.3	3.6	0.5	0.5	0.5	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.8	0.2	1.0	1.3	1.3	0.5	2.1	2.2	1.6	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.2	13.2	12.3	16.1	13.9	14.0	23.7	13.3	13.4	17.2	8.0	8.1
LnGrp LOS	B	B	B	B	B	B	C	B	B	B	A	A
Approach Vol, veh/h	262			553			762			802		
Approach Delay, s/veh	14.3			14.5			14.1			12.5		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.1	17.0		14.6	5.9	22.2		14.6				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	40.7	40.7		72.0	12.0	52.7		72.0				
Max Q Clear Time (g_c+10), s	9.2	9.2		9.8	3.3	5.2		9.0				
Green Ext Time (p_c), s	0.7	2.5		0.7	0.0	1.7		1.6				

### Intersection Summary









HCM 6th Ctrl Delay	13.7
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	186	727	100	280	735	190	80	140	210	120	170	151
Future Volume (veh/h)	186	727	100	280	735	190	80	140	210	120	170	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	196	765	89	295	774	158	84	147	88	126	179	65
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	896	104	289	911	186	102	741	419	119	898	315
Arrive On Green	0.13	0.28	0.27	0.16	0.31	0.31	0.06	0.34	0.33	0.07	0.35	0.34
Sat Flow, veh/h	1781	3207	373	1781	2939	600	1781	2188	1237	1781	2579	905
Grp Volume(v), veh/h	196	424	430	295	468	464	84	118	117	126	121	123
Grp Sat Flow(s),veh/h/ln	1781	1777	1803	1781	1777	1762	1781	1777	1648	1781	1777	1707
Q Serve(g_s), s	11.2	23.6	23.7	17.0	25.8	25.9	4.9	4.9	5.3	7.0	5.0	5.3
Cycle Q Clear(g_c), s	11.2	23.6	23.7	17.0	25.8	25.9	4.9	4.9	5.3	7.0	5.0	5.3
Prop In Lane	1.00		0.21	1.00		0.34	1.00		0.75	1.00		0.53
Lane Grp Cap(c), veh/h	235	497	504	289	551	546	102	602	558	119	619	595
V/C Ratio(X)	0.84	0.85	0.85	1.02	0.85	0.85	0.82	0.20	0.21	1.06	0.20	0.21
Avail Cap(c_a), veh/h	267	585	594	289	602	597	102	602	558	119	619	595
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	35.7	35.8	43.9	33.9	33.9	48.9	24.5	24.8	48.9	23.9	24.1
Incr Delay (d2), s/veh	18.2	10.3	10.2	58.4	10.4	10.5	39.7	0.7	0.9	99.2	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	11.1	11.3	11.9	12.1	12.0	3.2	2.1	2.1	6.3	2.1	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.6	46.1	46.0	102.3	44.3	44.4	88.6	25.3	25.7	148.1	24.6	24.9
LnGrp LOS	E	D	D	F	D	D	F	C	C	F	C	C
Approach Vol, veh/h	1050			1227			319			370		
Approach Delay, s/veh	49.1			58.3			42.1			66.7		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	1.0	39.5	21.0	33.3	10.0	40.5	17.8	36.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.5	35.0	16.5	34.0	5.5	36.0	15.2	35.0				
Max Q Clear Time (g_c+19.0), s	19.0	7.3	19.0	25.7	6.9	7.3	13.2	27.9				
Green Ext Time (p_c), s	0.0	1.2	0.0	3.1	0.0	1.3	0.1	3.1				

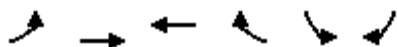
### Intersection Summary

HCM 6th Ctrl Delay	54.4
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

The Ranch  
Cumulative Plus Project PM Peak Hour

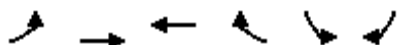


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	85	968	1142	880	310	55
Future Volume (veh/h)	85	968	1142	880	310	55
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	1019	1202	469	326	27
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	127	2161	1719	767	987	453
Arrive On Green	0.07	0.61	0.48	0.48	0.29	0.29
Sat Flow, veh/h	1781	3647	3647	1585	3456	1585
Grp Volume(v), veh/h	89	1019	1202	469	326	27
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1728	1585
Q Serve(g_s), s	3.7	11.9	19.9	16.3	5.6	0.9
Cycle Q Clear(g_c), s	3.7	11.9	19.9	16.3	5.6	0.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	127	2161	1719	767	987	453
V/C Ratio(X)	0.70	0.47	0.70	0.61	0.33	0.06
Avail Cap(c_a), veh/h	319	4272	3446	1537	987	453
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	8.1	15.2	14.3	21.2	19.5
Incr Delay (d2), s/veh	6.8	0.2	0.5	0.8	0.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	3.4	6.7	5.0	2.2	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	41.0	8.3	15.7	15.0	22.1	19.8
LnGrp LOS	D	A	B	B	C	B
Approach Vol, veh/h		1108	1671		353	
Approach Delay, s/veh		10.9	15.5		21.9	
Approach LOS		B	B		C	
Timer - Assigned Phs			4		6	7 8
Phs Duration (G+Y+Rc), s			49.8		25.5	9.4 40.4
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			90.0		21.0	13.0 72.5
Max Q Clear Time (g_c+I1), s			13.9		7.6	5.7 21.9
Green Ext Time (p_c), s			8.4		1.0	0.1 14.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			14.6			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary

## 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Cumulative Plus Project PM Peak Hour










Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	553	1031	962	280	1560	650
Future Volume (veh/h)	553	1031	962	280	1560	650
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	601	1121	1046	112	1696	493
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	435	3050	1156	516	1254	575
Arrive On Green	0.24	0.59	0.32	0.32	0.36	0.36
Sat Flow, veh/h	1810	5358	3705	1610	3510	1610
Grp Volume(v), veh/h	601	1121	1046	112	1696	493
Grp Sat Flow(s), veh/h/ln	1810	1729	1805	1610	1755	1610
Q Serve(g_s), s	35.0	16.5	40.4	7.4	52.0	41.3
Cycle Q Clear(g_c), s	35.0	16.5	40.4	7.4	52.0	41.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	435	3050	1156	516	1254	575
V/C Ratio(X)	1.38	0.37	0.91	0.22	1.35	0.86
Avail Cap(c_a), veh/h	435	3206	1264	564	1254	575
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.3	15.8	47.4	36.2	46.8	43.4
Incr Delay (d2), s/veh	185.7	0.0	8.5	0.1	164.2	11.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	58.0	6.2	19.0	2.9	50.5	17.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	241.0	15.8	55.8	36.2	211.0	55.1
LnGrp LOS	F	B	E	D	F	E
Approach Vol, veh/h		1722	1158		2189	
Approach Delay, s/veh		94.4	53.9		175.9	
Approach LOS		F	D		F	
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		89.6			39.0	50.6
Change Period (Y+Rc), s		5.3			4.5	5.3
Max Green Setting (Gmax), s		88.7			34.5	49.7
Max Q Clear Time (g_c+I1), s		18.5			37.0	42.4
Green Ext Time (p_c), s		5.5			0.0	2.9
Intersection Summary						
HCM 6th Ctrl Delay			120.3			
HCM 6th LOS			F			

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	788	1803	0	0	518	1120	724	0	410	0	0	0
Future Volume (veh/h)	788	1803	0	0	518	1120	724	0	410	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	829	1898	0	0	545	784	762	0	397			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	902	3292	0	0	643	1090	1038	0	462			
Arrive On Green	0.26	0.63	0.00	0.00	0.34	0.34	0.29	0.00	0.29			
Sat Flow, veh/h	3510	5358	0	0	1900	3220	3619	0	1610			
Grp Volume(v), veh/h	829	1898	0	0	545	784	762	0	397			
Grp Sat Flow(s),veh/h/ln	1755	1729	0	0	1900	1610	1810	0	1610			
Q Serve(g_s), s	23.4	21.5	0.0	0.0	27.1	21.7	19.4	0.0	23.8			
Cycle Q Clear(g_c), s	23.4	21.5	0.0	0.0	27.1	21.7	19.4	0.0	23.8			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	902	3292	0	0	643	1090	1038	0	462			
V/C Ratio(X)	0.92	0.58	0.00	0.00	0.85	0.72	0.73	0.00	0.86			
Avail Cap(c_a), veh/h	999	4873	0	0	1170	1982	1645	0	732			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	36.8	10.7	0.0	0.0	31.3	29.5	32.8	0.0	34.4			
Incr Delay (d2), s/veh	11.7	0.1	0.0	0.0	1.2	0.3	0.4	0.0	3.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.9	6.8	0.0	0.0	11.8	7.9	8.1	0.0	19.7			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.6	10.8	0.0	0.0	32.5	29.8	33.2	0.0	38.0			
LnGrp LOS	D	B	A	A	C	C	C	A	D			
Approach Vol, veh/h	2727			1329			1159					
Approach Delay, s/veh	22.3			30.9			34.8					
Approach LOS	C			C			C					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	68.6			33.2		30.2	38.5					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	94.4			45.0		29.0	61.4					
Max Q Clear Time (g_c+I1), s	23.5			25.8		25.4	29.1					
Green Ext Time (p_c), s	13.1			2.1		0.8	4.1					

### Intersection Summary




HCM 6th Ctrl Delay	27.3
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

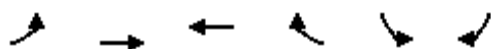
The Ranch  
Cumulative Plus Project PM Peak Hour

Intersection						
Int Delay, s/veh	139.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	627	123	120	441	109
Future Vol, veh/h	80	627	123	120	441	109
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	87	682	134	130	479	118
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1275	199	0	0	264	0
Stage 1	199	-	-	-	-	-
Stage 2	1076	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	186	847	-	-	1312	-
Stage 1	839	-	-	-	-	-
Stage 2	330	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	113	847	-	-	1312	-
Mov Cap-2 Maneuver	113	-	-	-	-	-
Stage 1	839	-	-	-	-	-
Stage 2	201	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	289.9	0	7.5			
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	488	1312	-	
HCM Lane V/C Ratio	-	-	1.575	0.365	-	
HCM Control Delay (s)	-	-	289.9	9.3	0	
HCM Lane LOS	-	-	F	A	A	
HCM 95th %tile Q(veh)	-	-	41.9	1.7	-	

# HCM 6th Signalized Intersection Summary

## 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↱↱	↰	↰	↰↰	
Traffic Volume (veh/h)	200	1651	1286	140	700	710	
Future Volume (veh/h)	200	1651	1286	140	700	710	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	217	1795	1398	0	761	768	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	290	1740	1318		785	1464	
Arrive On Green	0.08	0.49	0.37	0.00	0.44	0.44	
Sat Flow, veh/h	3456	3647	3647	1585	1781	2790	
Grp Volume(v), veh/h	217	1795	1398	0	761	768	
Grp Sat Flow(s),veh/h/ln	1728	1777	1777	1585	1781	1395	
Q Serve(g_s), s	7.1	56.3	42.7	0.0	48.0	20.8	
Cycle Q Clear(g_c), s	7.1	56.3	42.7	0.0	48.0	20.8	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	290	1740	1318		785	1464	
V/C Ratio(X)	0.75	1.03	1.06		0.97	0.52	
Avail Cap(c_a), veh/h	361	1740	1318		785	1464	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	51.5	29.3	36.2	0.0	31.4	17.9	
Incr Delay (d2), s/veh	4.8	30.2	42.6	0.0	24.5	0.2	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.2	29.0	25.1	0.0	25.2	18.1	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	56.2	59.5	78.7	0.0	55.9	18.1	
LnGrp LOS	E	F	F		E	B	
Approach Vol, veh/h							
		2012	1398	A	1529		
Approach Delay, s/veh							
		59.2	78.7		36.9		
Approach LOS							
		E	E		D		
Timer - Assigned Phs							
				4	6	7	8
Phs Duration (G+Y+Rc), s				60.3	54.7	13.6	46.7
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				55.8	50.2	11.5	39.8
Max Q Clear Time (g_c+I1), s				58.3	50.0	9.1	44.7
Green Ext Time (p_c), s				0.0	0.1	0.1	0.0
Intersection Summary							
HCM 6th Ctrl Delay			57.8				
HCM 6th LOS			E				

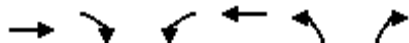
### Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Cumulative Plus Project PM Peak Hour














Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	1730	621	0	1723	333	80
Future Volume (veh/h)	1730	621	0	1723	333	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1880	484	0	1873	362	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	2265	1010	0	2265	1013	465
Arrive On Green	0.64	0.64	0.00	0.64	0.29	0.29
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1880	484	0	1873	362	59
Grp Sat Flow(s),veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	46.9	18.3	0.0	46.5	9.5	3.1
Cycle Q Clear(g_c), s	46.9	18.3	0.0	46.5	9.5	3.1
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2265	1010	0	2265	1013	465
V/C Ratio(X)	0.83	0.48	0.00	0.83	0.36	0.13
Avail Cap(c_a), veh/h	2565	1144	0	2565	1013	465
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	10.9	0.0	16.0	32.1	29.8
Incr Delay (d2), s/veh	2.2	0.4	0.0	2.1	1.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	6.2	0.0	16.6	4.1	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.3	11.2	0.0	18.1	33.1	30.4
LnGrp LOS	B	B	A	B	C	C
Approach Vol, veh/h	2364			1873	421	
Approach Delay, s/veh	16.8			18.1	32.7	
Approach LOS	B			B	C	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	37.7			77.3		77.3
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	23.5			82.5		82.5
Max Q Clear Time (g_c+I1), s	11.5			48.9		48.5
Green Ext Time (p_c), s	1.2			23.9		19.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			18.8			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Cumulative Plus Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	40	200	20	30	10	20	516	20	20	611	163
Future Volume (veh/h)	195	40	200	20	30	10	20	516	20	20	611	163
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	207	43	213	21	32	11	21	549	21	21	650	173
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	241	428	363	68	175	60	68	1071	478	68	1071	478
Arrive On Green	0.14	0.23	0.23	0.04	0.13	0.12	0.04	0.30	0.30	0.04	0.30	0.30
Sat Flow, veh/h	1781	1870	1585	1781	1331	457	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	207	43	213	21	0	43	21	549	21	21	650	173
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1788	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.6	0.7	4.9	0.5	0.0	0.9	0.5	5.2	0.4	0.5	6.4	3.5
Cycle Q Clear(g_c), s	4.6	0.7	4.9	0.5	0.0	0.9	0.5	5.2	0.4	0.5	6.4	3.5
Prop In Lane	1.00		1.00	1.00		0.26	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	241	428	363	68	0	236	68	1071	478	68	1071	478
V/C Ratio(X)	0.86	0.10	0.59	0.31	0.00	0.18	0.31	0.51	0.04	0.31	0.61	0.36
Avail Cap(c_a), veh/h	241	850	721	241	0	813	241	1703	760	241	1703	760
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	12.4	14.0	19.0	0.0	15.8	19.0	11.7	10.1	19.0	12.1	11.1
Incr Delay (d2), s/veh	25.5	0.1	1.5	2.5	0.0	0.4	2.5	0.4	0.0	2.5	0.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.3	1.6	0.2	0.0	0.3	0.2	1.5	0.1	0.2	1.8	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	12.5	15.5	21.6	0.0	16.1	21.6	12.1	10.1	21.6	12.7	11.6
LnGrp LOS	D	B	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	463			64			591			844		
Approach Delay, s/veh	27.4			17.9			12.4			12.7		
Approach LOS	C			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.6	16.3	5.6	13.3	5.6	16.3	9.5	9.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	19.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+12.5), s	7.2	7.2	2.5	6.9	2.5	8.4	6.6	2.9				
Green Ext Time (p_c), s	0.0	2.6	0.0	0.7	0.0	3.4	0.0	0.1				


### Intersection Summary

HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps


The Ranch  
Cumulative Plus Project Mitigated AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	🚗🚗		🚗🚗🚗					🚗🚗🚗		🚗🚗	🚗🚗🚗	
Traffic Volume (veh/h)	270	20	1105	0	0	0	0	2114	422	200	785	0
Future Volume (veh/h)	270	20	1105	0	0	0	0	2114	422	200	785	0
Initial Q (Qb), veh	0	0	60				0	60	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1826	1826	0
Adj Flow Rate, veh/h	293	22	673				0	2298	437	217	853	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	790	0	848				0	2886	396	236	3567	0
Arrive On Green	0.22	0.22	0.22				0.00	0.62	0.61	0.08	0.72	0.00
Sat Flow, veh/h	3456	0	3614				0	5021	803	3374	5149	0
Grp Volume(v), veh/h	293	0	673				0	1805	930	217	853	0
Grp Sat Flow(s),veh/h/ln	1728	0	1205				0	1122	1710	1687	1662	0
Q Serve(g_s), s	9.5	0.0	23.6				0.0	58.4	60.4	8.4	7.5	0.0
Cycle Q Clear(g_c), s	9.5	0.0	23.6				0.0	58.4	60.4	8.4	7.5	0.0
Prop In Lane	1.00		1.00				0.00		0.47	1.00		0.00
Lane Grp Cap(c), veh/h	790	0	848				0	2079	1074	236	3567	0
V/C Ratio(X)	0.37	0.00	0.79				0.00	0.87	0.87	0.92	0.24	0.00
Avail Cap(c_a), veh/h	925	0	968				0	2377	1207	257	4050	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.6	0.0	57.4				0.0	25.9	23.7	66.4	7.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	3.5				0.0	3.0	5.7	32.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	161.8				0.0	25.6	10.4	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	23.4				0.0	24.8	31.0	5.0	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.7	0.0	222.7				0.0	54.5	39.9	99.3	7.0	0.0
LnGrp LOS	D	A	F				A	D	D	F	A	A
Approach Vol, veh/h		966						2735			1070	
Approach Delay, s/veh		169.3						49.5			25.7	
Approach LOS		F						D			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	14.0	84.9		32.5		98.9						
Change Period (Y+Rc), s	4.0	4.9		5.3		4.9						
Max Green Setting (Gmax), s	10.0	91.9		33.9		105.9						
Max Q Clear Time (g_c+I1), s	10.4	62.4		25.6		9.5						
Green Ext Time (p_c), s	0.0	17.7		1.7		3.9						
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			68.4									
HCM 6th LOS			E									

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Cumulative Plus Project Mitigated AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↶	↷	↶	↶	↷	↶	↶	↶	↷	↷	↷
Traffic Volume (veh/h)	40	30	30	220	40	260	40	1865	170	180	916	30
Future Volume (veh/h)	40	30	30	220	40	260	40	1865	170	180	916	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	33	0	270	0	28	43	2027	182	196	996	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	1	1	1	2	2	2	2	2	2
Cap, veh/h	75	58	116	366	0	163	55	2043	181	255	2322	75
Arrive On Green	0.07	0.07	0.00	0.10	0.00	0.10	0.03	0.62	0.61	0.07	0.66	0.66
Sat Flow, veh/h	1021	784	1572	3591	0	1593	1781	3302	292	3456	3511	113
Grp Volume(v), veh/h	76	0	0	270	0	28	43	1076	1133	196	504	524
Grp Sat Flow(s),veh/h/ln	1804	0	1572	1795	0	1593	1781	1777	1817	1728	1777	1847
Q Serve(g_s), s	4.9	0.0	0.0	8.9	0.0	1.9	2.9	71.0	75.0	6.8	16.3	16.3
Cycle Q Clear(g_c), s	4.9	0.0	0.0	8.9	0.0	1.9	2.9	71.0	75.0	6.8	16.3	16.3
Prop In Lane	0.57		1.00	1.00		1.00	1.00		0.16	1.00		0.06
Lane Grp Cap(c), veh/h	133	0	116	366	0	163	55	1099	1124	255	1175	1222
V/C Ratio(X)	0.57	0.00	0.00	0.74	0.00	0.17	0.78	0.98	1.01	0.77	0.43	0.43
Avail Cap(c_a), veh/h	521	0	454	1126	0	499	235	1099	1124	456	1175	1222
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.3	0.0	0.0	52.9	0.0	49.8	58.3	22.4	23.2	55.1	9.7	9.7
Incr Delay (d2), s/veh	1.4	0.0	0.0	1.1	0.0	0.2	8.4	22.0	28.7	1.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	0.0	3.9	0.0	0.8	1.4	32.1	36.4	3.0	6.0	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	0.0	0.0	53.9	0.0	49.9	66.7	44.4	51.9	57.0	9.8	9.8
LnGrp LOS	E	A	A	D	A	D	E	D	F	E	A	A
Approach Vol, veh/h	76				298				2252			
Approach Delay, s/veh	55.8				53.6				48.6			
Approach LOS	E				D				D			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.9	79.0		12.9	7.8	84.2		16.4				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	16.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+I1), s	8.8	77.0		6.9	4.9	18.3		10.9				
Green Ext Time (p_c), s	0.2	0.0		0.2	0.0	5.0		0.5				

### Intersection Summary

HCM 6th Ctrl Delay	39.2
HCM 6th LOS	D























### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Cumulative Plus Project Mitigated AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	150	90	90	200	900	100	1036	30	540	979	150
Future Volume (veh/h)	160	150	90	90	200	900	100	1036	30	540	979	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	174	163	35	98	217	978	109	1126	32	587	1064	84
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	2	2	2
Cap, veh/h	196	870	182	119	480	1382	313	1220	35	629	1216	702
Arrive On Green	0.11	0.30	0.29	0.07	0.25	0.25	0.17	0.34	0.33	0.18	0.34	0.33
Sat Flow, veh/h	1781	2915	610	1795	1885	3195	1795	3555	101	3456	3554	1582
Grp Volume(v), veh/h	174	98	100	98	217	978	109	567	591	587	1064	84
Grp Sat Flow(s),veh/h/ln	1781	1777	1748	1795	1885	1598	1795	1791	1865	1728	1777	1582
Q Serve(g_s), s	14.0	5.9	6.2	7.8	14.1	36.4	7.8	44.2	44.3	24.3	40.9	2.3
Cycle Q Clear(g_c), s	14.0	5.9	6.2	7.8	14.1	36.4	7.8	44.2	44.3	24.3	40.9	2.3
Prop In Lane	1.00		0.35	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	196	530	522	119	480	1382	313	614	640	629	1216	702
V/C Ratio(X)	0.89	0.18	0.19	0.82	0.45	0.71	0.35	0.92	0.92	0.93	0.88	0.12
Avail Cap(c_a), veh/h	208	530	522	136	480	1382	313	653	680	642	1565	857
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.8	37.8	38.0	67.0	45.6	33.7	52.8	45.9	45.9	58.6	44.9	9.5
Incr Delay (d2), s/veh	31.1	0.1	0.1	25.6	0.2	1.4	0.2	17.6	17.2	20.2	4.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	2.6	2.7	4.4	6.5	13.9	3.5	22.1	22.9	12.4	18.6	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	94.8	37.9	38.1	92.6	45.9	35.2	53.0	63.5	63.1	78.7	48.9	9.5
LnGrp LOS	F	D	D	F	D	D	D	E	E	E	D	A
Approach Vol, veh/h		372			1293			1267			1735	
Approach Delay, s/veh		64.6			41.3			62.4			57.1	
Approach LOS		E			D			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	30.4	53.8	13.7	47.4	30.6	53.7	20.0	41.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	27.0	51.7	11.0	42.4	16.0	* 63	17.0	36.4				
Max Q Clear Time (g_c+I1), s	26.3	46.3	9.8	8.2	9.8	42.9	16.0	38.4				
Green Ext Time (p_c), s	0.1	2.3	0.0	0.6	0.1	5.5	0.0	0.0				

### Intersection Summary

HCM 6th Ctrl Delay 54.7  
HCM 6th LOS D

### Notes
























User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way























The Ranch  
Cumulative Plus Project Mitigated AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	761	317	308	970	310	471	425	165	390	605	30
Future Volume (veh/h)	40	761	317	308	970	310	471	425	165	390	605	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	43	827	92	335	1054	129	512	462	156	424	658	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	55	1085	460	409	1388	610	574	752	252	494	921	42
Arrive On Green	0.03	0.30	0.30	0.12	0.39	0.39	0.16	0.29	0.28	0.14	0.26	0.25
Sat Flow, veh/h	1795	3582	1519	3456	3554	1563	3483	2618	876	3483	3483	159
Grp Volume(v), veh/h	43	827	92	335	1054	129	512	315	303	424	338	350
Grp Sat Flow(s),veh/h/ln	1795	1791	1519	1728	1777	1563	1742	1791	1703	1742	1791	1851
Q Serve(g_s), s	2.5	22.4	4.8	10.1	27.5	5.9	15.4	16.2	16.6	12.7	18.3	18.3
Cycle Q Clear(g_c), s	2.5	22.4	4.8	10.1	27.5	5.9	15.4	16.2	16.6	12.7	18.3	18.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.51	1.00		0.09
Lane Grp Cap(c), veh/h	55	1085	460	409	1388	610	574	515	489	494	474	489
V/C Ratio(X)	0.78	0.76	0.20	0.82	0.76	0.21	0.89	0.61	0.62	0.86	0.71	0.72
Avail Cap(c_a), veh/h	101	1273	540	873	1962	863	619	654	621	652	670	693
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	33.8	27.6	46.0	28.2	21.6	43.7	32.9	33.3	44.8	35.6	35.7
Incr Delay (d2), s/veh	8.6	1.9	0.1	1.6	0.6	0.1	13.8	0.4	0.5	7.1	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	9.5	1.7	4.3	11.0	2.1	7.5	6.8	6.6	5.8	7.7	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.1	35.6	27.7	47.6	28.8	21.7	57.5	33.4	33.8	52.0	36.5	36.5
LnGrp LOS	E	D	C	D	C	C	E	C	C	D	D	D
Approach Vol, veh/h		962			1518			1130			1112	
Approach Delay, s/veh		36.0			32.4			44.4			42.4	
Approach LOS		D			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.1	34.7	16.6	36.4	21.6	32.3	7.3	45.7				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+I1), s	14.7	18.6	12.1	24.4	17.4	20.3	4.5	29.5				
Green Ext Time (p_c), s	0.4	2.1	0.5	3.0	0.2	2.2	0.0	5.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				38.3								
HCM 6th LOS				D								

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Cumulative Plus Project Mitigated AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	321	950	120	111	1220	310	300	499	263	480	224	322
Future Volume (veh/h)	321	950	120	111	1220	310	300	499	263	480	224	322
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	338	1000	49	117	1284	133	316	525	215	505	236	192
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	363	1734	85	145	1656	512	343	656	268	533	811	355
Arrive On Green	0.11	0.35	0.35	0.08	0.32	0.32	0.19	0.26	0.25	0.15	0.23	0.23
Sat Flow, veh/h	3456	4982	244	1781	5106	1578	1795	2481	1012	3483	3582	1568
Grp Volume(v), veh/h	338	683	366	117	1284	133	316	378	362	505	236	192
Grp Sat Flow(s),veh/h/ln	1728	1702	1822	1781	1702	1578	1795	1791	1702	1742	1791	1568
Q Serve(g_s), s	10.1	17.1	17.2	6.8	23.7	6.5	18.1	20.6	20.8	15.0	5.7	11.3
Cycle Q Clear(g_c), s	10.1	17.1	17.2	6.8	23.7	6.5	18.1	20.6	20.8	15.0	5.7	11.3
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.59	1.00		1.00
Lane Grp Cap(c), veh/h	363	1185	634	145	1656	512	343	474	450	533	811	355
V/C Ratio(X)	0.93	0.58	0.58	0.81	0.78	0.26	0.92	0.80	0.80	0.95	0.29	0.54
Avail Cap(c_a), veh/h	363	1344	719	272	2260	698	343	782	743	533	1428	625
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	27.8	27.8	47.2	31.9	26.1	41.5	35.9	36.3	43.9	33.5	35.7
Incr Delay (d2), s/veh	29.6	0.2	0.4	3.9	0.8	0.1	28.8	1.2	1.3	26.3	0.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	6.6	7.1	3.1	9.3	2.3	10.4	8.7	8.4	8.2	2.4	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.1	28.0	28.2	51.2	32.7	26.2	70.3	37.1	37.6	70.2	33.6	36.2
LnGrp LOS	E	C	C	D	C	C	E	D	D	E	C	D
Approach Vol, veh/h		1387			1534			1056			933	
Approach Delay, s/veh		39.8			33.5			47.2			53.9	
Approach LOS		D			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.0	31.7	12.5	40.4	24.0	27.7	15.0	37.9				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	16.0	44.4	16.0	40.0	20.0	40.4	11.0	45.0				
Max Q Clear Time (g_c+I1), s	17.0	22.8	8.8	19.2	20.1	13.3	12.1	25.7				
Green Ext Time (p_c), s	0.0	2.6	0.1	4.1	0.0	1.2	0.0	5.9				

### Intersection Summary

HCM 6th Ctrl Delay 42.1  
HCM 6th LOS D


### Notes

User approved pedestrian interval to be less than phase max green.



# HCM 6th Signalized Intersection Summary 12: SR 4 Eastbound & Lone Tree Way













The Ranch  
Cumulative Plus Project Mitigated AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↘↗	↑↑↑					↘	↗	↗
Traffic Volume (veh/h)	0	1815	850	290	1505	0	0	0	0	790	10	920
Future Volume (veh/h)	0	1815	850	290	1505	0	0	0	0	790	10	920
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1973	456	315	1636	0				867	0	972
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	1	1	0				2	2	2
Cap, veh/h	0	1801	559	240	2573	0				1578	0	702
Arrive On Green	0.00	0.35	0.35	0.12	0.50	0.00				0.44	0.00	0.44
Sat Flow, veh/h	0	5316	1596	1975	5316	0				3563	0	1585
Grp Volume(v), veh/h	0	1973	456	315	1636	0				867	0	972
Grp Sat Flow(s),veh/h/ln	0	1716	1596	987	1716	0				1781	0	1585
Q Serve(g_s), s	0.0	49.0	36.4	17.0	32.6	0.0				25.1	0.0	62.0
Cycle Q Clear(g_c), s	0.0	49.0	36.4	17.0	32.6	0.0				25.1	0.0	62.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1801	559	240	2573	0				1578	0	702
V/C Ratio(X)	0.00	1.10	0.82	1.31	0.64	0.00				0.55	0.00	1.38
Avail Cap(c_a), veh/h	0	1801	559	240	2573	0				1578	0	702
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	45.5	41.4	61.5	25.7	0.0				28.7	0.0	39.0
Incr Delay (d2), s/veh	0.0	52.3	8.6	167.6	0.4	0.0				0.2	0.0	181.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	28.8	15.2	9.8	12.8	0.0				10.4	0.0	58.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	97.8	50.0	229.1	26.1	0.0				29.0	0.0	220.9
LnGrp LOS	A	F	D	F	C	A				C	A	F
Approach Vol, veh/h		2429			1951						1839	
Approach Delay, s/veh		88.8			58.8						130.4	
Approach LOS		F			E						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	21.0	53.0		66.0		74.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	17.0	47.7		60.7		68.7						
Max Q Clear Time (g_c+I1), s	19.0	51.0		64.0		34.6						
Green Ext Time (p_c), s	0.0	0.0		0.0		9.2						
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				91.7								
HCM 6th LOS				F								
<b>Notes</b>												
User approved volume balancing among the lanes for turning movement.												

# HCM 6th Signalized Intersection Summary

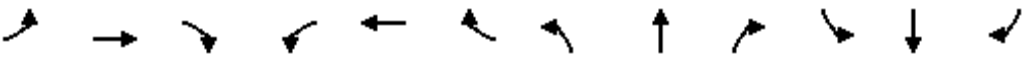
## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Cumulative Plus Project Mitigated AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1935	670	170	1035	620	760	50	930	0	0	0
Future Volume (veh/h)	0	1935	670	170	1035	620	760	50	930	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	0	2103	449	185	1125	321	865	0	876			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2			
Cap, veh/h	0	1897	588	132	2286	689	1696	0	754			
Arrive On Green	0.00	0.37	0.37	0.04	0.45	0.45	0.48	0.00	0.48			
Sat Flow, veh/h	0	5274	1582	3456	5106	1538	3563	0	1584			
Grp Volume(v), veh/h	0	2103	449	185	1125	321	865	0	876			
Grp Sat Flow(s),veh/h/ln	0	1702	1582	1728	1702	1538	1781	0	1584			
Q Serve(g_s), s	0.0	39.0	26.1	4.0	16.4	15.3	17.6	0.0	50.0			
Cycle Q Clear(g_c), s	0.0	39.0	26.1	4.0	16.4	15.3	17.6	0.0	50.0			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	1897	588	132	2286	689	1696	0	754			
V/C Ratio(X)	0.00	1.11	0.76	1.41	0.49	0.47	0.51	0.00	1.16			
Avail Cap(c_a), veh/h	0	1897	588	132	2286	689	1696	0	754			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	33.0	29.0	50.5	20.5	20.2	19.0	0.0	27.5			
Incr Delay (d2), s/veh	0.0	57.3	5.3	221.4	0.1	0.2	0.1	0.0	86.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	24.9	10.1	5.7	6.0	5.1	6.7	0.0	35.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	90.3	34.3	271.9	20.6	20.4	19.1	0.0	114.4			
LnGrp LOS	A	F	C	F	C	C	B	A	F			
Approach Vol, veh/h		2552			1631			1741				
Approach Delay, s/veh		80.4			49.1			67.1				
Approach LOS		F			D			E				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.0	43.0		54.0		51.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	4.0	37.7		48.7		45.7						
Max Q Clear Time (g_c+I1), s	6.0	41.0		52.0		18.4						
Green Ext Time (p_c), s	0.0	0.0		0.0		6.0						
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				67.9								
HCM 6th LOS				E								
<b>Notes</b>												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)




















The Ranch  
Cumulative Plus Project Mitigated AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗		↑↑	↗				↙↘		↗
Traffic Volume (veh/h)	0	1063	379	0	1850	570	0	0	0	960	0	190
Future Volume (veh/h)	0	1063	379	0	1850	570	0	0	0	960	0	190
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870				1885	0	1885
Adj Flow Rate, veh/h	0	1119	412	0	1947	392				1011	0	75
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95				0.95	0.92	0.95
Percent Heavy Veh, %	0	2	2	0	2	2				1	0	1
Cap, veh/h	0	3004	909	0	2091	932				1117	0	512
Arrive On Green	0.00	0.59	0.57	0.00	0.59	0.59				0.32	0.00	0.32
Sat Flow, veh/h	0	5274	1585	0	3647	1585				3483	0	1598
Grp Volume(v), veh/h	0	1119	412	0	1947	392				1011	0	75
Grp Sat Flow(s),veh/h/ln	0	1702	1585	0	1777	1585				1742	0	1598
Q Serve(g_s), s	0.0	10.1	13.2	0.0	43.8	11.9				24.4	0.0	2.9
Cycle Q Clear(g_c), s	0.0	10.1	13.2	0.0	43.8	11.9				24.4	0.0	2.9
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3004	909	0	2091	932				1117	0	512
V/C Ratio(X)	0.00	0.37	0.45	0.00	0.93	0.42				0.91	0.00	0.15
Avail Cap(c_a), veh/h	0	3081	933	0	2145	957				1150	0	528
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	9.5	10.8	0.0	16.5	9.9				28.6	0.0	21.3
Incr Delay (d2), s/veh	0.0	0.0	0.1	0.0	7.8	0.1				9.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.1	3.8	0.0	16.2	3.4				10.8	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	9.6	10.9	0.0	24.2	10.0				38.3	0.0	21.3
LnGrp LOS	A	A	B	A	C	B				D	A	C
Approach Vol, veh/h		1531			2339						1086	
Approach Delay, s/veh		9.9			21.8						37.1	
Approach LOS		A			C						D	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		55.7			55.7			32.2				
Change Period (Y+Rc), s		5.3			5.3			5.3				
Max Green Setting (Gmax), s		51.7			51.7			27.7				
Max Q Clear Time (g_c+I1), s		15.2			45.8			26.4				
Green Ext Time (p_c), s		6.4			4.5			0.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			21.5									
HCM 6th LOS			C									

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Cumulative Plus Project Mitigated AM Peak Hour




												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	517	1506	0	0	1846	1170	574	10	220	0	0	0
Future Volume (veh/h)	517	1506	0	0	1846	1170	574	10	220	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	562	1637	0	0	2007	1037	632	0	192			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	405	3577	0	0	2022	1714	779	0	347			
Arrive On Green	0.12	0.69	0.00	0.00	0.54	0.54	0.22	0.00	0.22			
Sat Flow, veh/h	3483	5316	0	0	3770	3195	3534	0	1572			
Grp Volume(v), veh/h	562	1637	0	0	2007	1037	632	0	192			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	11.0	13.5	0.0	0.0	49.9	21.1	16.0	0.0	10.3			
Cycle Q Clear(g_c), s	11.0	13.5	0.0	0.0	49.9	21.1	16.0	0.0	10.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	405	3577	0	0	2022	1714	779	0	347			
V/C Ratio(X)	1.39	0.46	0.00	0.00	0.99	0.61	0.81	0.00	0.55			
Avail Cap(c_a), veh/h	405	3577	0	0	2022	1714	1731	0	770			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	41.8	6.5	0.0	0.0	21.7	15.0	35.0	0.0	32.7			
Incr Delay (d2), s/veh	188.7	0.0	0.0	0.0	18.2	0.4	0.8	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	15.1	3.6	0.0	0.0	23.6	6.7	6.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	230.5	6.5	0.0	0.0	39.9	15.5	35.8	0.0	33.2			
LnGrp LOS	F	A	A	A	D	B	D	A	C			
Approach Vol, veh/h	2199			3044			824					
Approach Delay, s/veh	63.7			31.6			35.2					
Approach LOS	E			C			D					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	69.7			24.8		15.0	54.7					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	64.4			45.0		11.0	49.4					
Max Q Clear Time (g_c+I1), s	15.5			18.0		13.0	51.9					
Green Ext Time (p_c), s	9.7			1.5		0.0	0.0					
Intersection Summary												
HCM 6th Ctrl Delay	43.7											
HCM 6th LOS	D											

# HCM 6th Signalized Intersection Summary

## 22: Deer Valley Road & Balfour Road

The Ranch  
Cumulative Plus Project Mitigated AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	120	535	54	50	510	130
Future Volume (veh/h)	120	535	54	50	510	130
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	130	125	59	24	554	141
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	172	165	686	279	772	148
Arrive On Green	0.20	0.20	0.53	0.53	0.53	0.53
Sat Flow, veh/h	867	833	1284	522	1086	276
Grp Volume(v), veh/h	256	0	0	83	695	0
Grp Sat Flow(s),veh/h/ln	1707	0	0	1806	1362	0
Q Serve(g_s), s	4.8	0.0	0.0	0.8	15.7	0.0
Cycle Q Clear(g_c), s	4.8	0.0	0.0	0.8	16.5	0.0
Prop In Lane	0.51	0.49		0.29	0.80	
Lane Grp Cap(c), veh/h	339	0	0	965	920	0
V/C Ratio(X)	0.76	0.00	0.00	0.09	0.76	0.00
Avail Cap(c_a), veh/h	912	0	0	965	920	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.7	0.0	0.0	3.8	7.9	0.0
Incr Delay (d2), s/veh	3.4	0.0	0.0	0.0	3.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.0	0.1	3.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.2	0.0	0.0	3.9	11.5	0.0
LnGrp LOS	B	A	A	A	B	A
Approach Vol, veh/h	256		83		695	
Approach Delay, s/veh	16.2		3.9		11.5	
Approach LOS	B		A		B	
Timer - Assigned Phs	2		6		8	
Phs Duration (G+Y+Rc), s	22.5		22.5		11.2	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	18.0		18.0		18.0	
Max Q Clear Time (g_c+I1), s	2.8		18.5		6.8	
Green Ext Time (p_c), s	0.3		0.0		0.6	
Intersection Summary						
HCM 6th Ctrl Delay			12.0			
HCM 6th LOS			B			
Notes						

# HCM 6th Signalized Intersection Summary 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Cumulative Plus Project Mitigated AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←←	→→	←←←	→	←←	→
Traffic Volume (veh/h)	355	1470	948	100	480	910
Future Volume (veh/h)	355	1470	948	100	480	910
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1870	1870	1796	1796
Adj Flow Rate, veh/h	386	1598	1030	0	522	605
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	2	2	7	7
Cap, veh/h	431	1569	1451		1666	764
Arrive On Green	0.12	0.44	0.28	0.00	0.50	0.50
Sat Flow, veh/h	3483	3676	5274	1585	3319	1522
Grp Volume(v), veh/h	386	1598	1030	0	522	605
Grp Sat Flow(s),veh/h/ln	1742	1791	1702	1585	1659	1522
Q Serve(g_s), s	16.4	65.7	27.1	0.0	13.9	49.3
Cycle Q Clear(g_c), s	16.4	65.7	27.1	0.0	13.9	49.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	431	1569	1451		1666	764
V/C Ratio(X)	0.90	1.02	0.71		0.31	0.79
Avail Cap(c_a), veh/h	476	1569	1451		1666	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	64.8	42.2	48.1	0.0	22.1	30.9
Incr Delay (d2), s/veh	17.1	27.5	1.4	0.0	0.0	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	33.7	11.5	0.0	5.5	38.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	81.8	69.6	49.5	0.0	22.1	36.1
LnGrp LOS	F	F	D		C	D
Approach Vol, veh/h		1984	1030	A	1127	
Approach Delay, s/veh		72.0	49.5		29.6	
Approach LOS		E	D		C	
Timer - Assigned Phs				4	6	7
Phs Duration (G+Y+Rc), s				70.2	79.8	23.1
Change Period (Y+Rc), s				4.5	4.5	4.5
Max Green Setting (Gmax), s				65.7	75.3	20.5
Max Q Clear Time (g_c+I1), s				67.7	51.3	18.4
Green Ext Time (p_c), s				0.0	2.4	0.2

## Intersection Summary

HCM 6th Ctrl Delay	54.9
HCM 6th LOS	D


























## Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Cumulative Plus Project Mitigated PM Peak Hour
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 		  					  		 	  	
Traffic Volume (veh/h)	540	0	2416	0	0	0	0	1900	478	470	1030	0
Future Volume (veh/h)	540	0	2416	0	0	0	0	1900	478	470	1030	0
Initial Q (Qb), veh	0	0	20				0	20	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	0	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	587	0	2523				0	2065	494	511	1120	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	0	1				0	1	1	1	1	0
Cap, veh/h	1606	0	1680				0	1847	124	329	2545	0
Arrive On Green	0.46	0.00	0.46				0.00	0.38	0.37	0.09	0.49	0.00
Sat Flow, veh/h	3483	0	3643				0	4874	978	3483	5316	0
Grp Volume(v), veh/h	587	0	2523				0	1698	861	511	1120	0
Grp Sat Flow(s),veh/h/ln	1742	0	1214				0	1131	1705	1742	1716	0
Q Serve(g_s), s	19.7	0.0	83.0				0.0	68.0	68.0	17.0	25.3	0.0
Cycle Q Clear(g_c), s	19.7	0.0	83.0				0.0	68.0	68.0	17.0	25.3	0.0
Prop In Lane	1.00		1.00				0.00		0.57	1.00		0.00
Lane Grp Cap(c), veh/h	1606	0	1680				0	1282	689	329	2545	0
V/C Ratio(X)	0.37	0.00	1.50				0.00	1.32	1.25	1.55	0.44	0.00
Avail Cap(c_a), veh/h	1606	0	1680				0	1282	644	329	2545	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.4	0.0	48.5				0.0	56.0	56.1	81.5	29.4	0.0
Incr Delay (d2), s/veh	0.1	0.0	229.1				0.0	151.6	124.0	263.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	42.9				0.0	42.1	26.1	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	0.0	66.6				0.0	41.9	59.3	19.6	10.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.5	0.0	320.5				0.0	249.7	206.2	345.0	29.4	0.0
LnGrp LOS	C	A	F				A	F	F	F	C	A
Approach Vol, veh/h	3110						2559			1631		
Approach Delay, s/veh	265.9						235.0			128.3		
Approach LOS	F						F			F		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	21.0	72.0	87.0		93.0							
Change Period (Y+Rc), s	4.0	4.9	5.3		4.9							
Max Green Setting (Gmax), s	17.0	67.1	81.7		88.1							
Max Q Clear Time (g_c+I1), s	19.0	70.0	85.0		27.3							
Green Ext Time (p_c), s	0.0	0.0	0.0		5.5							
Intersection Summary												
HCM 6th Ctrl Delay	224.4											
HCM 6th LOS	F											



# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Cumulative Plus Project Mitigated PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	60	80	180	40	150	80	1071	160	220	1334	30
Future Volume (veh/h)	70	60	80	180	40	150	80	1071	160	220	1334	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	76	65	5	227	0	17	87	1164	166	239	1450	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	118	101	189	375	0	166	113	1459	207	337	1785	39
Arrive On Green	0.12	0.12	0.12	0.10	0.00	0.10	0.06	0.46	0.46	0.10	0.50	0.49
Sat Flow, veh/h	989	846	1578	3591	0	1593	1795	3142	447	3483	3583	79
Grp Volume(v), veh/h	141	0	5	227	0	17	87	662	668	239	724	758
Grp Sat Flow(s),veh/h/ln	1836	0	1578	1795	0	1593	1795	1791	1798	1742	1791	1871
Q Serve(g_s), s	5.5	0.0	0.2	4.5	0.0	0.7	3.6	23.4	23.6	5.0	25.4	25.4
Cycle Q Clear(g_c), s	5.5	0.0	0.2	4.5	0.0	0.7	3.6	23.4	23.6	5.0	25.4	25.4
Prop In Lane	0.54		1.00	1.00		1.00	1.00		0.25	1.00		0.04
Lane Grp Cap(c), veh/h	219	0	189	375	0	166	113	832	835	337	892	932
V/C Ratio(X)	0.64	0.00	0.03	0.61	0.00	0.10	0.77	0.80	0.80	0.71	0.81	0.81
Avail Cap(c_a), veh/h	863	0	742	1833	0	813	386	1804	1811	749	1804	1885
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	0.0	28.9	31.9	0.0	30.2	34.4	16.9	17.1	32.6	15.7	15.8
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.6	0.0	0.1	4.1	0.7	0.7	1.0	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.1	1.8	0.0	0.3	1.6	8.0	8.2	2.1	9.3	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.4	0.0	29.0	32.5	0.0	30.3	38.5	17.6	17.8	33.6	16.4	16.4
LnGrp LOS	C	A	C	C	A	C	D	B	B	C	B	B
Approach Vol, veh/h		146			244			1417			1721	
Approach Delay, s/veh		32.3			32.3			19.0			18.8	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.2	38.6		12.9	8.7	41.1		11.8				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	16.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+I1), s	7.0	25.6		7.5	5.6	27.4		6.5				
Green Ext Time (p_c), s	0.3	6.1		0.4	0.1	9.0		0.4				

### Intersection Summary

HCM 6th Ctrl Delay	20.4
HCM 6th LOS	C




















### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Cumulative Plus Project Mitigated PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	220	110	80	130	740	140	858	70	1060	1380	230
Future Volume (veh/h)	170	220	110	80	130	740	140	858	70	1060	1380	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	185	239	74	87	141	804	152	933	73	1152	1500	185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	186	646	195	107	367	1625	226	917	72	1109	1635	871
Arrive On Green	0.10	0.24	0.23	0.06	0.19	0.19	0.13	0.27	0.26	0.32	0.46	0.45
Sat Flow, veh/h	1795	2710	819	1795	1885	3195	1795	3364	263	3483	3582	1577
Grp Volume(v), veh/h	185	156	157	87	141	804	152	497	509	1152	1500	185
Grp Sat Flow(s),veh/h/ln	1795	1791	1738	1795	1885	1598	1795	1791	1836	1742	1791	1577
Q Serve(g_s), s	14.9	10.5	10.9	6.9	9.4	23.9	11.7	39.4	39.4	46.0	56.6	4.3
Cycle Q Clear(g_c), s	14.9	10.5	10.9	6.9	9.4	23.9	11.7	39.4	39.4	46.0	56.6	4.3
Prop In Lane	1.00		0.47	1.00		1.00	1.00		0.14	1.00		1.00
Lane Grp Cap(c), veh/h	186	427	414	107	367	1625	226	488	501	1109	1635	871
V/C Ratio(X)	0.99	0.37	0.38	0.81	0.38	0.49	0.67	1.02	1.02	1.04	0.92	0.21
Avail Cap(c_a), veh/h	186	491	476	112	438	1747	226	488	501	1109	1745	920
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.7	45.9	46.2	67.1	50.7	23.3	60.3	52.5	52.6	49.2	36.7	6.2
Incr Delay (d2), s/veh	63.6	0.2	0.2	31.0	0.2	0.1	6.3	45.1	44.6	37.7	7.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	4.6	4.7	4.0	4.4	8.7	5.6	23.3	23.9	25.7	26.2	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	128.3	46.1	46.4	98.1	50.9	23.4	66.7	97.7	97.3	86.9	44.3	6.2
LnGrp LOS	F	D	D	F	D	C	E	F	F	F	D	A
Approach Vol, veh/h	498			1032			1158			2837		
Approach Delay, s/veh	76.7			33.5			93.4			59.1		
Approach LOS	E			C			F			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	50.0	43.4	12.6	38.5	23.5	69.9	19.0	32.1				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	46.0	38.1	9.0	39.0	15.0	* 69	15.0	33.0				
Max Q Clear Time (g_c+I1), s	48.0	41.4	8.9	12.9	13.7	58.6	16.9	25.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	6.1	0.0	1.6				

### Intersection Summary

HCM 6th Ctrl Delay 63.1

HCM 6th LOS E

### Notes





























User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way























The Ranch  
Cumulative Plus Project Mitigated PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  		 	  		 	 			 	
Traffic Volume (veh/h)	100	891	442	286	900	270	362	481	283	380	406	40
Future Volume (veh/h)	100	891	442	286	900	270	362	481	283	380	406	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	109	968	203	311	978	102	393	523	248	413	441	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	134	1190	249	326	1419	148	457	627	296	413	1227	100
Arrive On Green	0.07	0.28	0.27	0.09	0.30	0.29	0.13	0.27	0.25	0.23	0.36	0.35
Sat Flow, veh/h	1810	4273	893	3510	4772	497	3510	2365	1117	1810	3379	275
Grp Volume(v), veh/h	109	783	388	311	708	372	393	399	372	413	235	242
Grp Sat Flow(s),veh/h/ln	1810	1729	1708	1755	1729	1811	1755	1805	1677	1810	1805	1849
Q Serve(g_s), s	7.0	25.0	25.2	10.4	21.4	21.5	13.0	24.7	24.9	27.0	11.3	11.4
Cycle Q Clear(g_c), s	7.0	25.0	25.2	10.4	21.4	21.5	13.0	24.7	24.9	27.0	11.3	11.4
Prop In Lane	1.00		0.52	1.00		0.27	1.00		0.67	1.00		0.15
Lane Grp Cap(c), veh/h	134	963	476	326	1028	538	457	478	444	413	655	671
V/C Ratio(X)	0.81	0.81	0.82	0.95	0.69	0.69	0.86	0.83	0.84	1.00	0.36	0.36
Avail Cap(c_a), veh/h	168	1090	538	326	1090	571	623	590	549	413	682	699
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.9	39.8	40.2	53.4	36.7	36.9	50.4	41.0	41.5	45.7	27.6	27.7
Incr Delay (d2), s/veh	16.9	3.7	7.5	37.1	1.4	2.6	7.0	6.9	7.7	44.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	10.7	11.2	6.2	8.9	9.6	6.0	11.5	10.9	16.7	4.7	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.8	43.5	47.7	90.5	38.1	39.6	57.4	48.0	49.2	90.0	27.7	27.8
LnGrp LOS	E	D	D	F	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1280			1391			1164			890	
Approach Delay, s/veh		47.1			50.2			51.6			56.6	
Approach LOS		D			D			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	31.0	35.4	15.0	37.0	19.4	47.0	12.8	39.2				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	27.0	37.4	11.0	36.0	21.0	43.4	11.0	36.0				
Max Q Clear Time (g_c+I1), s	29.0	26.9	12.4	27.2	15.0	13.4	9.0	23.5				
Green Ext Time (p_c), s	0.0	2.2	0.0	3.4	0.4	1.6	0.0	3.6				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			50.9									
HCM 6th LOS			D									

# HCM 6th Signalized Intersection Summary


## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Cumulative Plus Project Mitigated PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	336	1402	170	220	1200	320	270	421	320	510	354	145
Future Volume (veh/h)	336	1402	170	220	1200	320	270	421	320	510	354	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	365	1524	120	239	1304	143	293	458	233	554	385	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	391	1614	127	242	1824	558	316	571	288	574	851	372
Arrive On Green	0.11	0.33	0.32	0.13	0.35	0.35	0.18	0.25	0.24	0.16	0.24	0.24
Sat Flow, veh/h	3483	4863	383	1795	5147	1575	1795	2298	1160	3483	3582	1565
Grp Volume(v), veh/h	365	1075	569	239	1304	143	293	356	335	554	385	34
Grp Sat Flow(s),veh/h/ln	1742	1716	1815	1795	1716	1575	1795	1791	1668	1742	1791	1565
Q Serve(g_s), s	13.9	40.7	40.7	17.7	29.2	8.6	21.5	24.9	25.3	21.1	12.3	2.3
Cycle Q Clear(g_c), s	13.9	40.7	40.7	17.7	29.2	8.6	21.5	24.9	25.3	21.1	12.3	2.3
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.70	1.00		1.00
Lane Grp Cap(c), veh/h	391	1139	602	242	1824	558	316	445	415	574	851	372
V/C Ratio(X)	0.93	0.94	0.94	0.99	0.71	0.26	0.93	0.80	0.81	0.97	0.45	0.09
Avail Cap(c_a), veh/h	391	1141	604	242	1828	559	323	598	557	574	1143	499
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.7	43.4	43.5	57.6	37.3	30.6	54.2	47.0	47.6	55.4	43.5	39.7
Incr Delay (d2), s/veh	28.6	14.9	23.5	54.0	1.2	0.1	31.1	4.0	4.6	28.7	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	19.0	21.5	11.5	12.1	3.2	12.2	11.3	10.8	11.3	5.3	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.4	58.3	67.0	111.6	38.4	30.7	85.2	51.0	52.2	84.1	43.6	39.7
LnGrp LOS	F	E	E	F	D	C	F	D	D	F	D	D
Approach Vol, veh/h	2009					1686			984		973	
Approach Delay, s/veh	66.1					48.1			61.6		66.5	
Approach LOS	E					D			E		E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.0	37.2	22.0	48.3	27.5	35.7	19.0	51.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	22.0	43.3	18.0	43.1	24.0	41.3	15.0	46.1				
Max Q Clear Time (g_c+I1), s	23.1	27.3	19.7	42.7	23.5	14.3	15.9	31.2				
Green Ext Time (p_c), s	0.0	2.3	0.0	0.3	0.0	1.5	0.0	5.5				
Intersection Summary												
HCM 6th Ctrl Delay			60.0									
HCM 6th LOS			E									

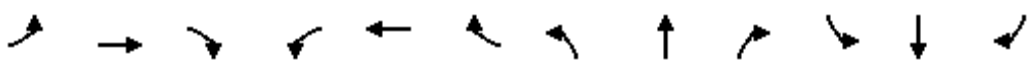
# HCM 6th Signalized Intersection Summary 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Cumulative Plus Project Mitigated PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	2610	1200	430	1926	0	0	0	0	880	10	850
Future Volume (veh/h)	0	2610	1200	430	1926	0	0	0	0	880	10	850
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	2747	942	453	2027	0				934	0	858
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2386	728	259	3268	0				1050	0	467
Arrive On Green	0.00	0.46	0.46	0.13	0.63	0.00				0.29	0.00	0.29
Sat Flow, veh/h	0	5358	1582	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	2747	942	453	2027	0				934	0	858
Grp Sat Flow(s),veh/h/ln	0	1729	1582	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	46.0	46.0	13.0	23.7	0.0				24.7	0.0	29.0
Cycle Q Clear(g_c), s	0.0	46.0	46.0	13.0	23.7	0.0				24.7	0.0	29.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2386	728	259	3268	0				1050	0	467
V/C Ratio(X)	0.00	1.15	1.29	1.75	0.62	0.00				0.89	0.00	1.84
Avail Cap(c_a), veh/h	0	2386	728	259	3268	0				1050	0	467
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	27.0	27.0	43.5	11.2	0.0				34.0	0.0	35.5
Incr Delay (d2), s/veh	0.0	73.4	142.8	353.3	0.3	0.0				9.3	0.0	385.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	33.1	44.2	15.8	7.5	0.0				11.5	0.0	60.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	100.4	169.8	396.8	11.5	0.0				43.3	0.0	420.6
LnGrp LOS	A	F	F	F	B	A				D	A	F
Approach Vol, veh/h		3689			2480						1792	
Approach Delay, s/veh		118.1			81.9						224.0	
Approach LOS		F			F						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.0	50.0		33.0		67.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	13.0	44.7		27.7		61.7						
Max Q Clear Time (g_c+I1), s	15.0	48.0		31.0		25.7						
Green Ext Time (p_c), s	0.0	0.0		0.0		13.2						
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			130.7									
HCM 6th LOS			F									
<b>Notes</b>												
User approved volume balancing among the lanes for turning movement.												

# HCM 6th Signalized Intersection Summary 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Cumulative Plus Project Mitigated PM Peak Hour

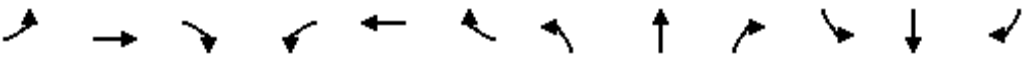
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↘↘	↑↑↑	↗	↘	↗	↗			
Traffic Volume (veh/h)	0	2790	700	210	1346	730	1010	50	420	0	0	0
Future Volume (veh/h)	0	2790	700	210	1346	730	1010	50	420	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	0	2937	549	221	1417	456	1101	0	305			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	1	1	1	1	1	1	1	1			
Cap, veh/h	0	2793	854	216	3255	983	1122	0	499			
Arrive On Green	0.00	0.54	0.54	0.06	0.63	0.63	0.31	0.00	0.31			
Sat Flow, veh/h	0	5316	1573	3483	5147	1554	3591	0	1598			
Grp Volume(v), veh/h	0	2937	549	221	1417	456	1101	0	305			
Grp Sat Flow(s),veh/h/ln	0	1716	1573	1742	1716	1554	1795	0	1598			
Q Serve(g_s), s	0.0	78.7	35.5	9.0	20.3	22.1	44.1	0.0	23.5			
Cycle Q Clear(g_c), s	0.0	78.7	35.5	9.0	20.3	22.1	44.1	0.0	23.5			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2793	854	216	3255	983	1122	0	499			
V/C Ratio(X)	0.00	1.05	0.64	1.02	0.44	0.46	0.98	0.00	0.61			
Avail Cap(c_a), veh/h	0	2793	854	216	3255	983	1122	0	499			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	33.1	23.3	68.0	13.5	13.9	49.4	0.0	42.4			
Incr Delay (d2), s/veh	0.0	32.5	1.3	67.1	0.0	0.1	22.3	0.0	1.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	38.6	12.8	6.0	7.3	7.3	22.6	0.0	9.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	65.7	24.6	135.1	13.6	14.0	71.8	0.0	44.0			
LnGrp LOS	A	F	C	F	B	B	E	A	D			
Approach Vol, veh/h		3486			2094			1406				
Approach Delay, s/veh		59.2			26.5			65.7				
Approach LOS		E			C			E				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	13.0	82.7		49.3		95.7						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	9.0	77.4		44.0		90.4						
Max Q Clear Time (g_c+I1), s	11.0	80.7		46.1		24.1						
Green Ext Time (p_c), s	0.0	0.0		0.0		9.3						
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			50.7									
HCM 6th LOS			D									

## Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Cumulative Plus Project Mitigated PM Peak Hour


























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗		↑↑	↗				↘↘		↗
Traffic Volume (veh/h)	0	1031	553	0	962	280	0	0	0	1560	0	650
Future Volume (veh/h)	0	1031	553	0	962	280	0	0	0	1560	0	650
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1870	0	1900	1900				1900	0	1900
Adj Flow Rate, veh/h	0	1121	601	0	1046	112				1696	0	493
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	0	0	0				0	0	0
Cap, veh/h	0	2156	659	0	1501	669				1804	0	827
Arrive On Green	0.00	0.42	0.42	0.00	0.42	0.42				0.51	0.00	0.51
Sat Flow, veh/h	0	5358	1585	0	3705	1610				3510	0	1610
Grp Volume(v), veh/h	0	1121	601	0	1046	112				1696	0	493
Grp Sat Flow(s),veh/h/ln	0	1729	1585	0	1805	1610				1755	0	1610
Q Serve(g_s), s	0.0	18.3	40.5	0.0	27.0	5.0				51.5	0.0	24.3
Cycle Q Clear(g_c), s	0.0	18.3	40.5	0.0	27.0	5.0				51.5	0.0	24.3
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2156	659	0	1501	669				1804	0	827
V/C Ratio(X)	0.00	0.52	0.91	0.00	0.70	0.17				0.94	0.00	0.60
Avail Cap(c_a), veh/h	0	2288	699	0	1592	710				1920	0	881
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	24.7	31.2	0.0	27.2	20.8				25.9	0.0	19.3
Incr Delay (d2), s/veh	0.0	0.1	15.2	0.0	1.0	0.0				9.2	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.1	17.1	0.0	11.1	1.8				21.6	0.0	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	24.8	46.4	0.0	28.3	20.8				35.1	0.0	19.9
LnGrp LOS	A	C	D	A	C	C				D	A	B
Approach Vol, veh/h		1722			1158						2189	
Approach Delay, s/veh		32.3			27.5						31.7	
Approach LOS		C			C						C	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		51.1			51.1			62.2				
Change Period (Y+Rc), s		5.3			5.3			5.3				
Max Green Setting (Gmax), s		48.7			48.7			60.7				
Max Q Clear Time (g_c+I1), s		42.5			29.0			53.5				
Green Ext Time (p_c), s		3.4			4.7			3.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			31.0									
HCM 6th LOS			C									



# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road










The Ranch  
Cumulative Plus Project Mitigated PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  			 	 		 				
Traffic Volume (veh/h)	788	1803	0	0	518	1120	724	0	410	0	0	0
Future Volume (veh/h)	788	1803	0	0	518	1120	724	0	410	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	829	1898	0	0	635	724	762	0	397			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	941	3169	0	0	1124	952	1068	0	475			
Arrive On Green	0.27	0.61	0.00	0.00	0.30	0.30	0.30	0.00	0.30			
Sat Flow, veh/h	3510	5358	0	0	3800	3220	3619	0	1610			
Grp Volume(v), veh/h	829	1898	0	0	635	724	762	0	397			
Grp Sat Flow(s),veh/h/ln	1755	1729	0	0	1900	1610	1810	0	1610			
Q Serve(g_s), s	19.3	19.1	0.0	0.0	12.0	17.4	16.0	0.0	19.6			
Cycle Q Clear(g_c), s	19.3	19.1	0.0	0.0	12.0	17.4	16.0	0.0	19.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	941	3169	0	0	1124	952	1068	0	475			
V/C Ratio(X)	0.88	0.60	0.00	0.00	0.57	0.76	0.71	0.00	0.84			
Avail Cap(c_a), veh/h	1733	5669	0	0	2099	1779	2084	0	927			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	29.8	10.2	0.0	0.0	25.3	27.2	26.8	0.0	28.1			
Incr Delay (d2), s/veh	1.1	0.1	0.0	0.0	0.2	0.5	0.3	0.0	1.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.6	5.7	0.0	0.0	5.0	6.2	6.4	0.0	16.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	10.2	0.0	0.0	25.5	27.7	27.1	0.0	29.6			
LnGrp LOS	C	B	A	A	C	C	C	A	C			
Approach Vol, veh/h	2727			1359			1159					
Approach Delay, s/veh	16.5			26.7			28.0					
Approach LOS	B			C			C					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	56.0			29.1		26.8	29.2					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	91.7			47.7		42.0	45.7					
Max Q Clear Time (g_c+I1), s	21.1			21.6		21.3	19.4					
Green Ext Time (p_c), s	13.0			2.2		1.6	4.5					
Intersection Summary												
HCM 6th Ctrl Delay				21.7								
HCM 6th LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												

# HCM 6th Signalized Intersection Summary

## 22: Deer Valley Road & Balfour Road

The Ranch  
Cumulative Plus Project Mitigated PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	80	627	123	120	441	109
Future Volume (veh/h)	80	627	123	120	441	109
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	87	189	134	73	479	118
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	115	250	692	377	711	139
Arrive On Green	0.22	0.21	0.60	0.59	0.60	0.60
Sat Flow, veh/h	524	1139	1157	630	942	232
Grp Volume(v), veh/h	277	0	0	207	597	0
Grp Sat Flow(s),veh/h/ln	1669	0	0	1787	1174	0
Q Serve(g_s), s	6.8	0.0	0.0	2.3	17.2	0.0
Cycle Q Clear(g_c), s	6.8	0.0	0.0	2.3	19.6	0.0
Prop In Lane	0.31	0.68		0.35	0.80	
Lane Grp Cap(c), veh/h	367	0	0	1069	850	0
V/C Ratio(X)	0.76	0.00	0.00	0.19	0.70	0.00
Avail Cap(c_a), veh/h	723	0	0	1547	1195	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.2	0.0	0.0	4.1	8.5	0.0
Incr Delay (d2), s/veh	3.2	0.0	0.0	0.1	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.0	0.5	3.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.4	0.0	0.0	4.1	9.5	0.0
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	277		207		597	
Approach Delay, s/veh	19.4		4.1		9.5	
Approach LOS	B		A		A	
Timer - Assigned Phs	2		6		8	
Phs Duration (G+Y+Rc), s	30.2		30.2		13.6	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	37.5		37.5		18.5	
Max Q Clear Time (g_c+I1), s	4.3		21.6		8.8	
Green Ext Time (p_c), s	1.3		4.2		0.6	
Intersection Summary						
HCM 6th Ctrl Delay			11.0			
HCM 6th LOS			B			

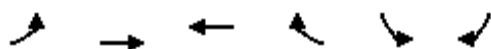
### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Cumulative Plus Project Mitigated PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↱↱	↰	↰↰	↰	
Traffic Volume (veh/h)	211	1640	1286	140	700	710	
Future Volume (veh/h)	211	1640	1286	140	700	710	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	229	1783	1398	0	761	768	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	309	1977	1536		1292	734	
Arrive On Green	0.09	0.56	0.43	0.00	0.37	0.37	
Sat Flow, veh/h	3456	3647	3647	1585	3456	1585	
Grp Volume(v), veh/h	229	1783	1398	0	761	768	
Grp Sat Flow(s),veh/h/ln	1728	1777	1777	1585	1728	1585	
Q Serve(g_s), s	7.4	51.4	42.3	0.0	20.3	43.0	
Cycle Q Clear(g_c), s	7.4	51.4	42.3	0.0	20.3	43.0	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	309	1977	1536		1292	734	
V/C Ratio(X)	0.74	0.90	0.91		0.59	1.05	
Avail Cap(c_a), veh/h	841	2423	1536		1292	734	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	51.1	22.7	30.6	0.0	28.9	30.9	
Incr Delay (d2), s/veh	1.3	3.9	8.2	0.0	0.5	45.8	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.2	20.1	18.5	0.0	8.4	45.4	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	52.4	26.6	38.8	0.0	29.4	76.6	
LnGrp LOS	D	C	D		C	F	
Approach Vol, veh/h							
		2012	1398	A	1529		
Approach Delay, s/veh							
		29.6	38.8		53.1		
Approach LOS							
		C	D		D		
Timer - Assigned Phs							
				4	6	7	8
Phs Duration (G+Y+Rc), s				68.0	47.0	14.3	53.7
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				77.9	28.1	27.5	45.9
Max Q Clear Time (g_c+I1), s				53.4	45.0	9.4	44.3
Green Ext Time (p_c), s				10.1	0.0	0.4	1.0
Intersection Summary							
HCM 6th Ctrl Delay			39.5				
HCM 6th LOS			D				

### Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# Appendix C: Signal Warrant Assessment

Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Existing Conditions  
Peak Hour AM

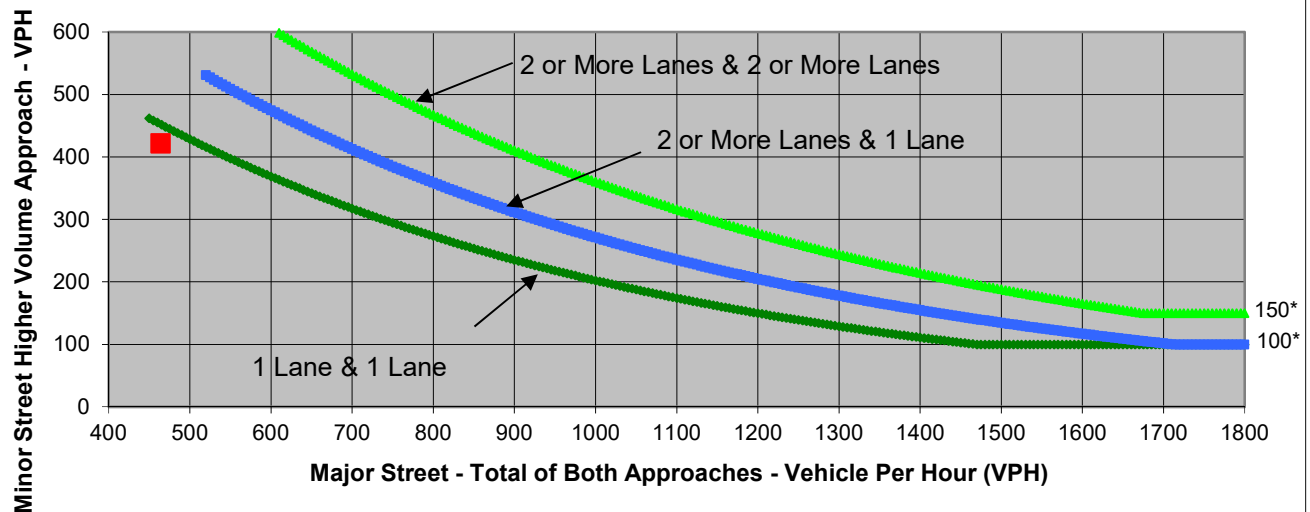
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	373	0	79
Through	23	38	0	0
Right	30	0	0	343
Total	53	411	0	422

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	464	422	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Existing Conditions  
Peak Hour AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	373	0	79
Through	23	38	0	0
Right	30	0	0	343
Total	53	411	0	422

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	22.9
Approach with Worst Case Delay	WB
Total Vehicles on Approach	422

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Existing Conditions	2.7	422	886
Limiting Value	4	100	650
Condition Satisfied?	Not Met	Met	Met
Warrant Met	<u>NO</u>		



Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

Project **The Ranch**  
 Scenario **Existing with Project Conditions**  
 Peak Hour **AM**

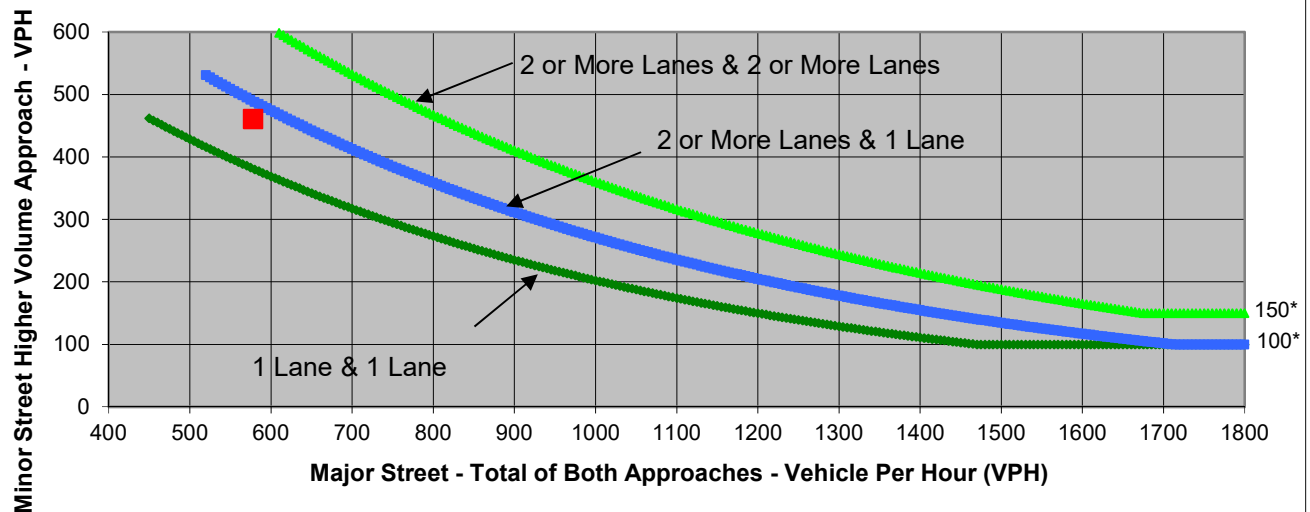
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	473	0	79
Through	27	48	0	0
Right	30	0	0	382
Total	57	521	0	461

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	578	461	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			





Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Existing with Project Conditions
Peak Hour	AM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	473	0	79
Through	27	48	0	0
Right	30	0	0	382
Total	57	521	0	461

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	51.5
Approach with Worst Case Delay	WB
Total Vehicles on Approach	461

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Existing with Project Conditions	6.6	461	1,039
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Existing with Phase 1 Conditions  
Peak Hour AM

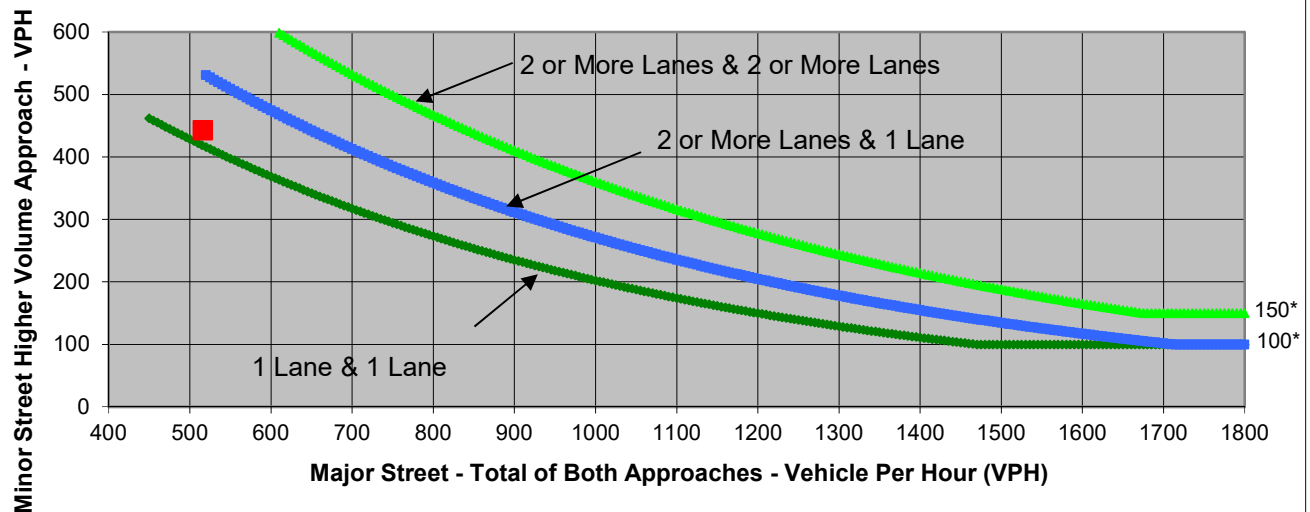
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	422	0	79
Through	26	38	0	0
Right	30	0	0	364
Total	56	460	0	443

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	516	443	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Existing with Phase 1 Conditions
Peak Hour	AM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	422	0	79
Through	26	38	0	0
Right	30	0	0	364
Total	56	460	0	443

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	31.3
Approach with Worst Case Delay	WB
Total Vehicles on Approach	443

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Existing with Phase 1 Conditions	3.9	443	959
Limiting Value	4	100	650
Condition Satisfied?	Not Met	Met	Met
Warrant Met	<u>NO</u>		

Major Street Deer Valley Road  
 Minor Street Balfour Road

Project The Ranch  
 Scenario Existing with Phase 2 Conditions  
 Peak Hour AM

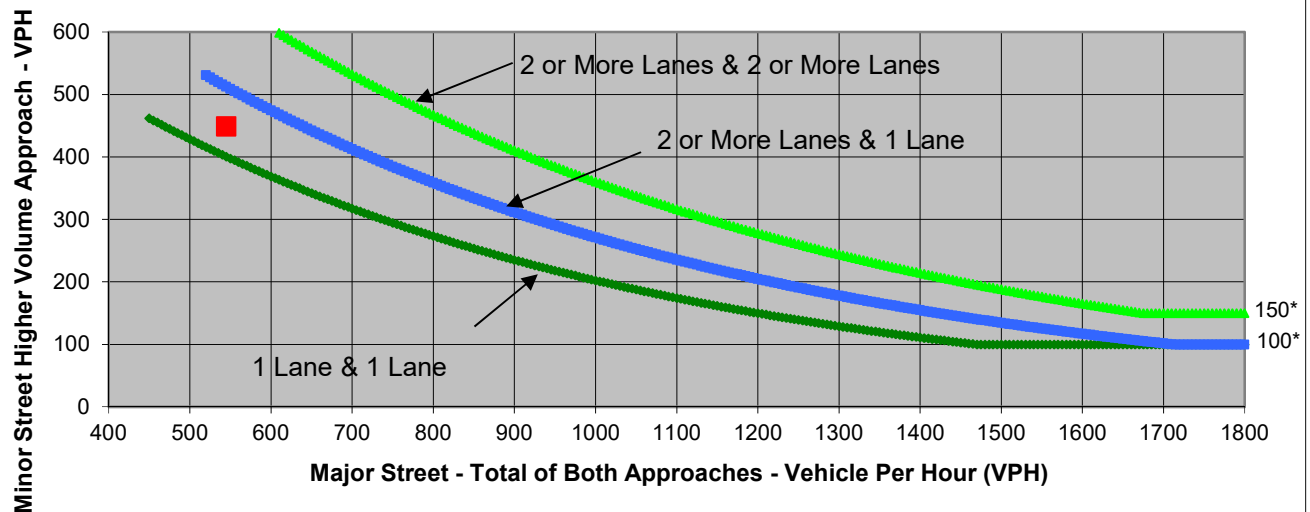
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	444	0	79
Through	26	45	0	0
Right	30	0	0	370
Total	56	489	0	449

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	545	449	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Existing with Phase 2 Conditions
Peak Hour	AM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	444	0	79
Through	26	45	0	0
Right	30	0	0	370
Total	56	489	0	449

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	38
Approach with Worst Case Delay	WB
Total Vehicles on Approach	449

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Existing with Phase 2 Conditions	4.7	449	994
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Near Term Conditions  
Peak Hour AM

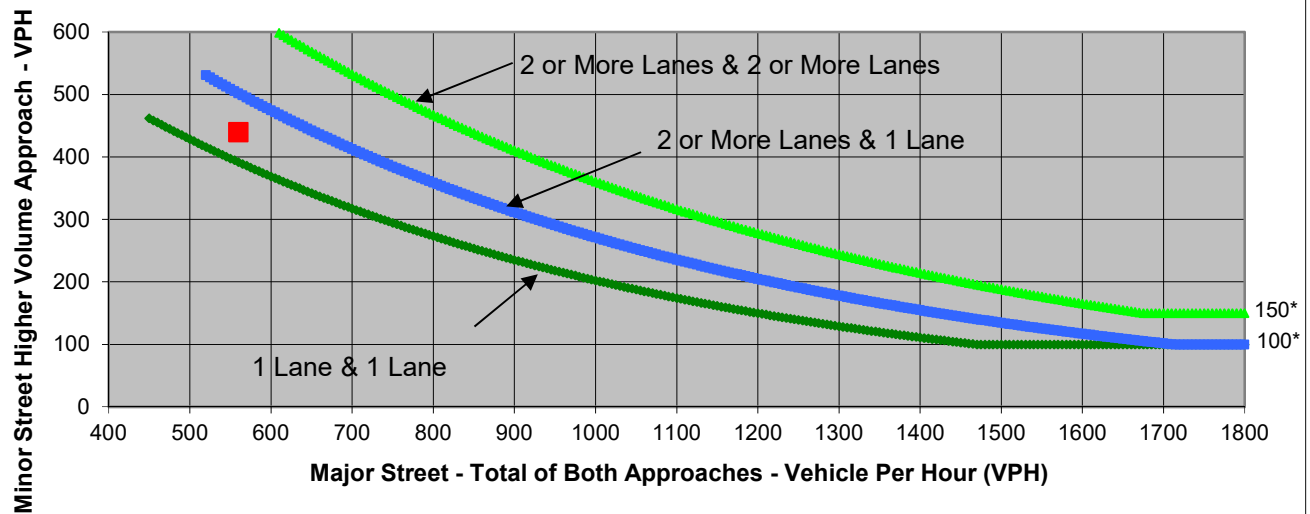
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	390	0	80
Through	40	100	0	0
Right	30	0	0	360
Total	70	490	0	440

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	560	440	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Near Term Conditions
Peak Hour	AM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	390	0	80
Through	40	100	0	0
Right	30	0	0	360
Total	70	490	0	440

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	33.2
Approach with Worst Case Delay	WB
Total Vehicles on Approach	440

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Near Term Conditions	4.1	440	1,000
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		



Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

Project **The Ranch**  
 Scenario **Near Term with Project Conditions**  
 Peak Hour **AM**

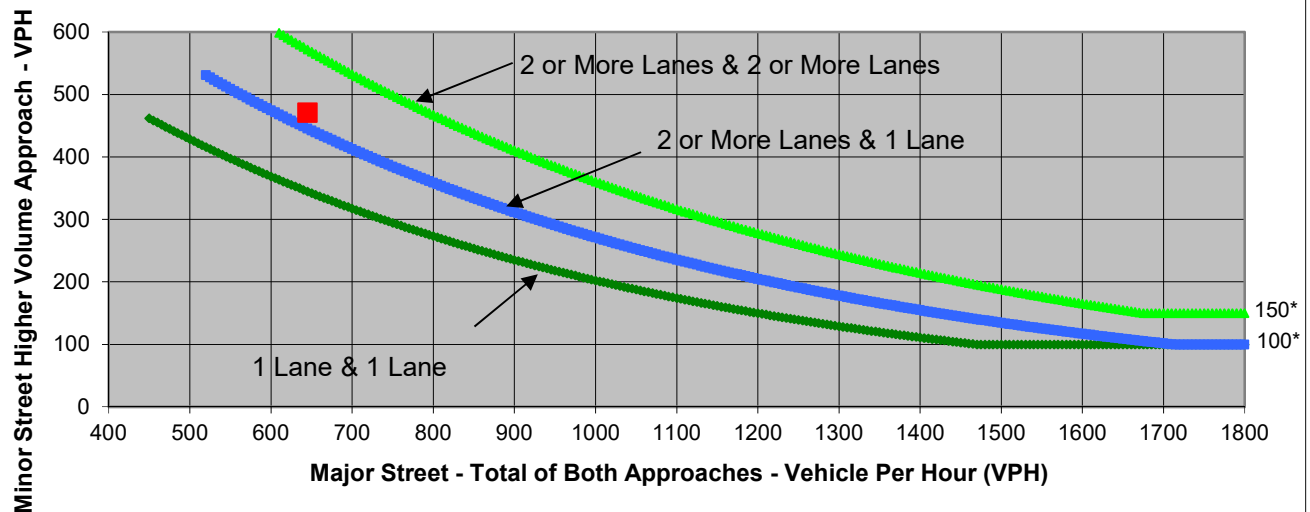
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	461	0	80
Through	44	110	0	0
Right	30	0	0	391
Total	74	571	0	471

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	645	471	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Near Term with Project Conditions
Peak Hour	AM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	461	0	80
Through	44	110	0	0
Right	30	0	0	391
Total	74	571	0	471

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	71.4
Approach with Worst Case Delay	WB
Total Vehicles on Approach	471

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Near Term with Project Conditions	9.3	471	1,116
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		



Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

Project **The Ranch**  
 Scenario **Near Term with Phase 1 Conditions**  
 Peak Hour **AM**

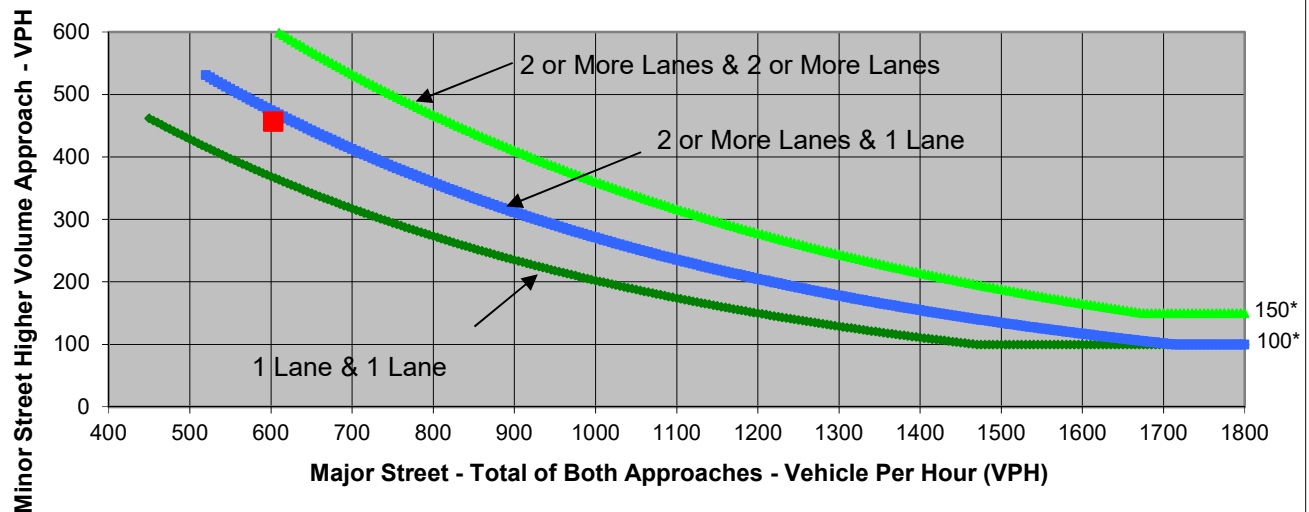
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	425	0	80
Through	43	105	0	0
Right	30	0	0	377
Total	73	530	0	457

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<b>YES</b>
Traffic Volume (VPH) *	603	457	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Near Term with Phase 1 Conditions
Peak Hour	AM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	425	0	80
Through	43	105	0	0
Right	30	0	0	377
Total	73	530	0	457

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	47.2
Approach with Worst Case Delay	WB
Total Vehicles on Approach	457

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Near Term with Phase 1 Conditions	6	457	1,060
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		



Major Street Deer Valley Road  
 Minor Street Balfour Road

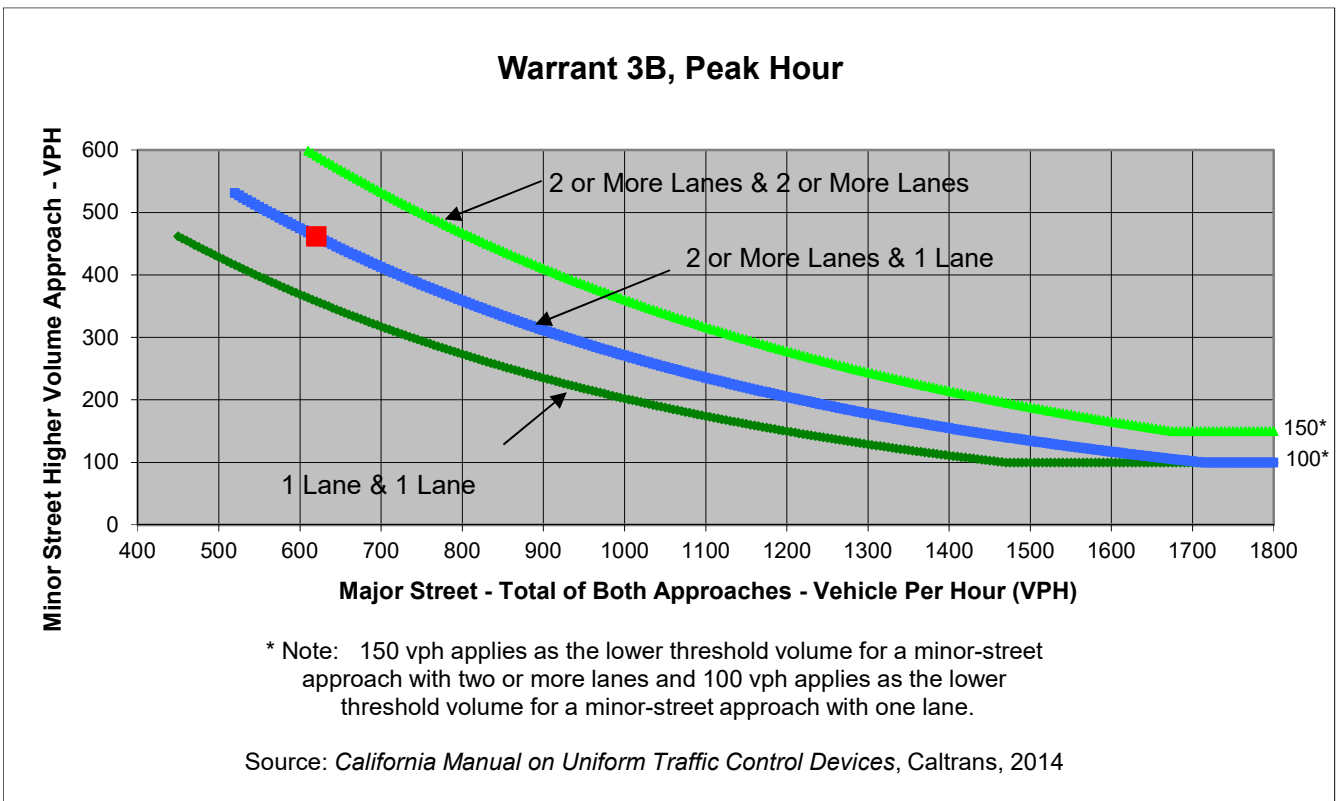
Project The Ranch  
 Scenario Near Term with Phase 2 Conditions  
 Peak Hour AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	440	0	80
Through	43	107	0	0
Right	30	0	0	382
Total	73	547	0	462

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	620	462	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Near Term with Phase 2 Conditions
Peak Hour	AM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	440	0	80
Through	43	107	0	0
Right	30	0	0	382
Total	73	547	0	462

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	55.2
Approach with Worst Case Delay	WB
Total Vehicles on Approach	462

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Near Term with Phase 2 Conditions	7.1	462	1,082
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		



Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

Project **The Ranch**  
 Scenario **Near Term Conditions**  
 Peak Hour **PM**

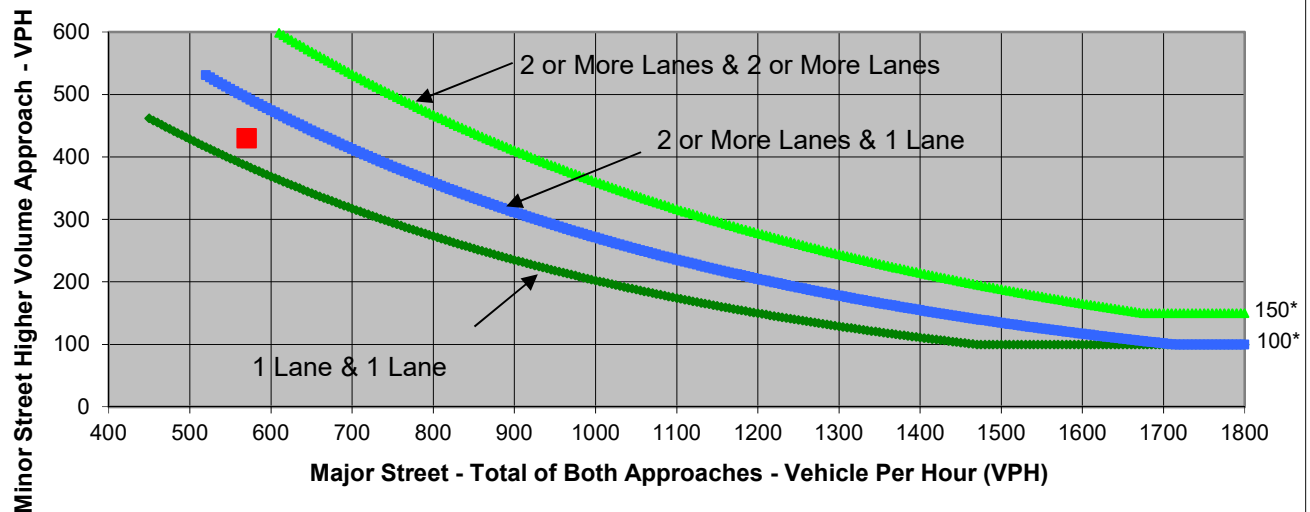
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	340	0	40
Through	100	80	0	0
Right	50	0	0	390
Total	150	420	0	430

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<b>YES</b>
Traffic Volume (VPH) *	570	430	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.





Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Near Term Conditions  
Peak Hour PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	340	0	40
Through	100	80	0	0
Right	50	0	0	390
Total	150	420	0	430

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street  
Total Approaches

1
3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)  
Approach with Worst Case Delay  
Total Vehicles on Approach

20.7
WB
430

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Near Term Conditions	2.5	430	1,000
Limiting Value	4	100	650
Condition Satisfied?	Not Met	Met	Met
Warrant Met	<u>NO</u>		



Major Street Deer Valley Road  
 Minor Street Balfour Road

Project The Ranch  
 Scenario Near Term with Project Conditions  
 Peak Hour PM

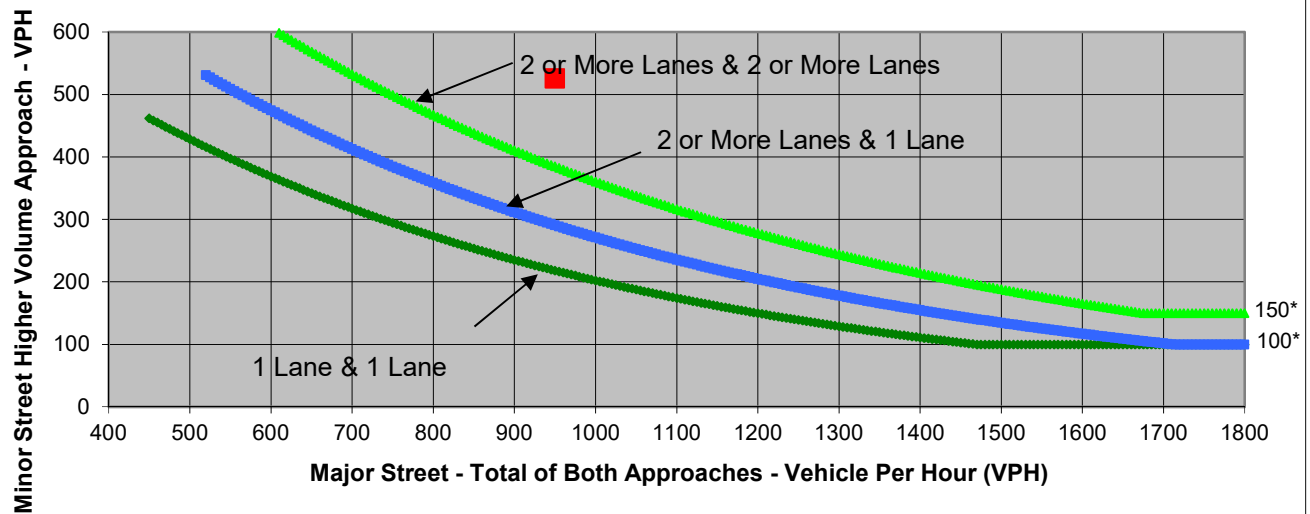
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	698	0	40
Through	113	89	0	0
Right	50	0	0	486
Total	163	787	0	526

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	950	526	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Near Term with Project Conditions
Peak Hour	PM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	698	0	40
Through	113	89	0	0
Right	50	0	0	486
Total	163	787	0	526

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	37.1
Approach with Worst Case Delay	WB
Total Vehicles on Approach	526

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Near Term with Project Conditions	5.4	526	1,476
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		



Major Street Deer Valley Road  
 Minor Street Balfour Road

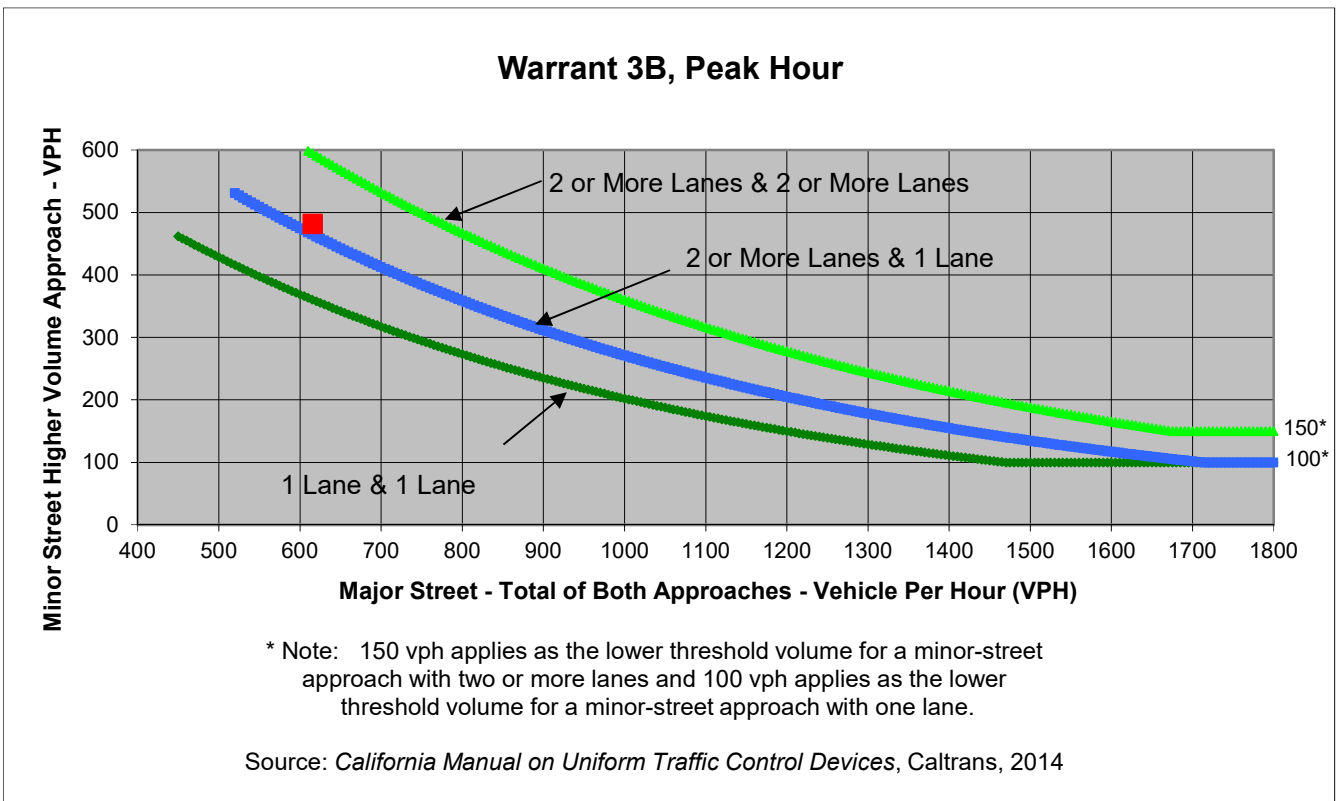
Project The Ranch  
 Scenario Near Term with Phase 1 Conditions  
 Peak Hour PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	374	0	40
Through	107	85	0	0
Right	50	0	0	442
Total	157	459	0	482

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	616	482	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Near Term with Phase 1 Conditions
Peak Hour	PM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	374	0	40
Through	107	85	0	0
Right	50	0	0	442
Total	157	459	0	482

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	27.3
Approach with Worst Case Delay	WB
Total Vehicles on Approach	482

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Near Term with Phase 1 Conditions	3.7	482	1,098
Limiting Value	4	100	650
Condition Satisfied?	Not Met	Met	Met
Warrant Met	<u>NO</u>		

Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Near Term with Phase 2 Conditions  
Peak Hour PM

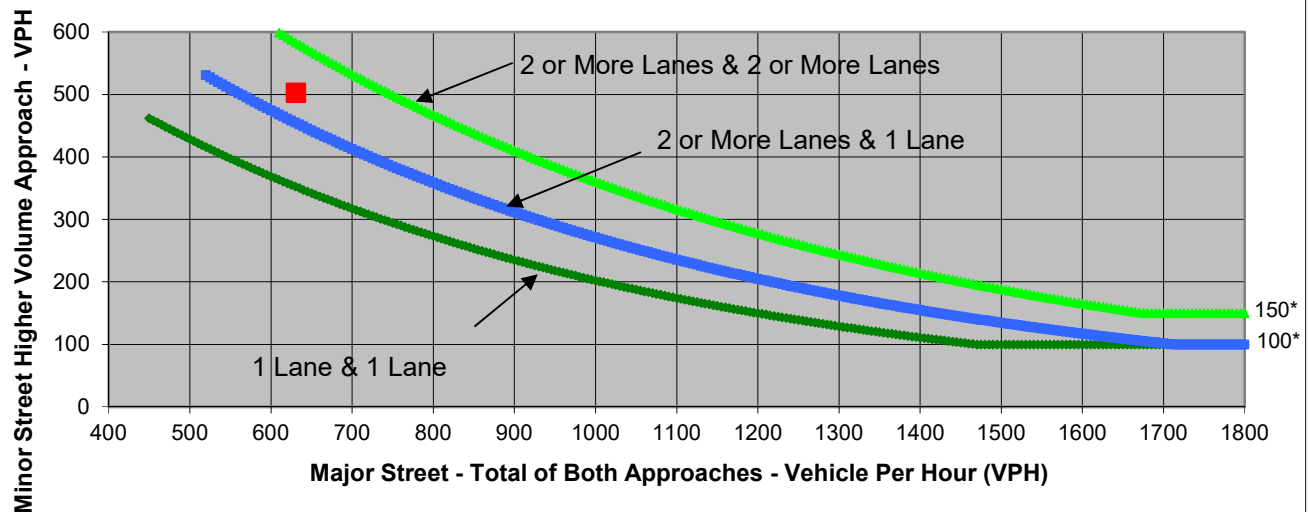
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	384	0	40
Through	110	87	0	0
Right	50	0	0	463
Total	160	471	0	503

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	631	503	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Near Term with Phase 2 Conditions
Peak Hour	PM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	384	0	40
Through	110	87	0	0
Right	50	0	0	463
Total	160	471	0	503

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	31.2
Approach with Worst Case Delay	WB
Total Vehicles on Approach	503

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Near Term with Phase 2 Conditions	4.4	503	1,134
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		





Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

Project **The Ranch**  
 Scenario **Cumulative Conditions**  
 Peak Hour **AM**

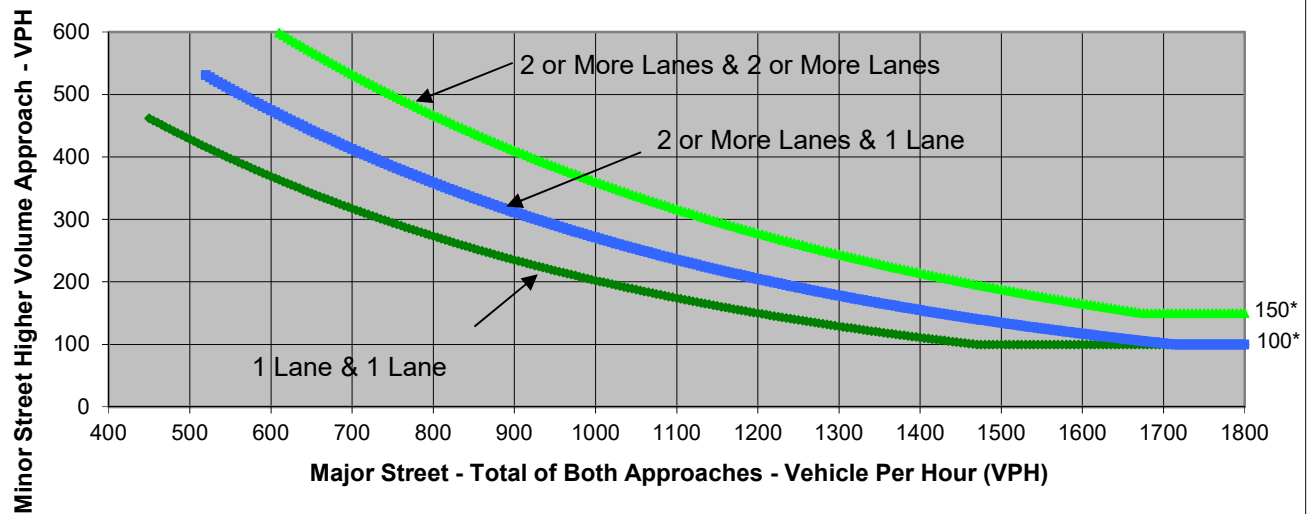
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	470	0	120
Through	50	120	0	0
Right	50	0	0	520
Total	100	590	0	640

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	690	640	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative Conditions
Peak Hour	AM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	470	0	120
Through	50	120	0	0
Right	50	0	0	520
Total	100	590	0	640

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street

1

Total Approaches

3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)

315.2

Approach with Worst Case Delay

WB

Total Vehicles on Approach

640

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced (vph)
Cumulative Conditions	56	640	1,330
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Cumulative with Project Conditions  
Peak Hour AM

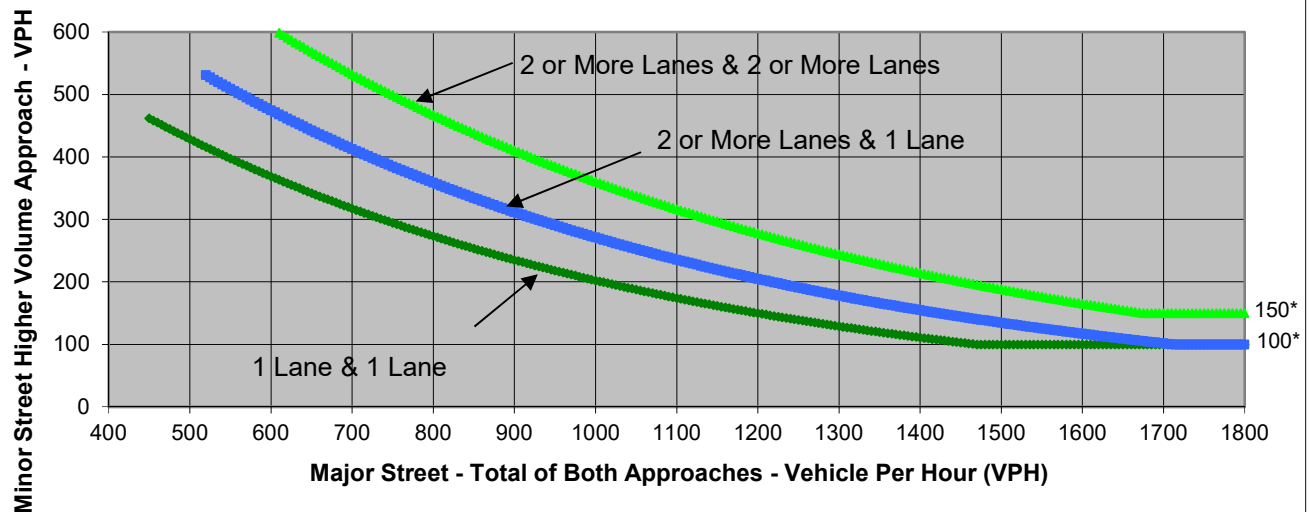
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	510	0	120
Through	54	130	0	0
Right	50	0	0	535
Total	104	640	0	655

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	744	655	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

# FEHR & PEERS

Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative with Project Conditions
Peak Hour	AM

## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	510	0	120
Through	54	130	0	0
Right	50	0	0	535
Total	104	640	0	655

## Major Street Direction

x	North/South
	East/West

## Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

## Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	426.9
Approach with Worst Case Delay	WB
Total Vehicles on Approach	655

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Project Condition	77.7	655	1,399
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

Project **The Ranch**  
 Scenario **Cumulative with Phase 1 Conditions**  
 Peak Hour **AM**

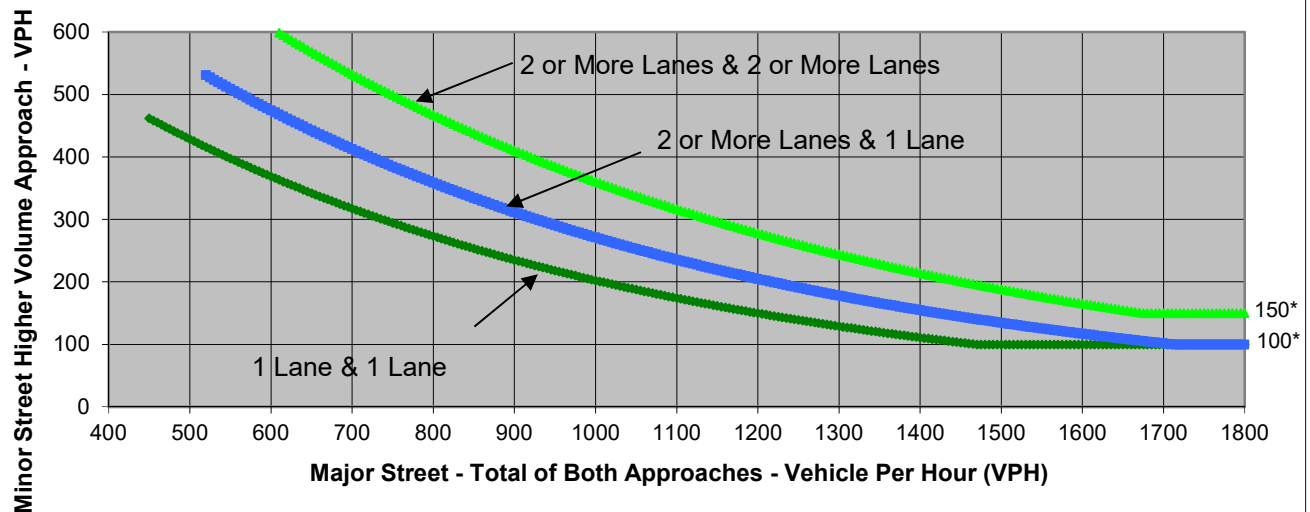
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	489	0	120
Through	53	125	0	0
Right	50	0	0	529
Total	103	614	0	649

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	717	649	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative with Phase 1 Conditions
Peak Hour	AM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	489	0	120
Through	53	125	0	0
Right	50	0	0	529
Total	103	614	0	649

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	371.3
Approach with Worst Case Delay	WB
Total Vehicles on Approach	649

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Phase 1 Condition	66.9	649	1,366
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

Project **The Ranch**  
 Scenario **Cumulative with Phase 2 Conditions**  
 Peak Hour **AM**

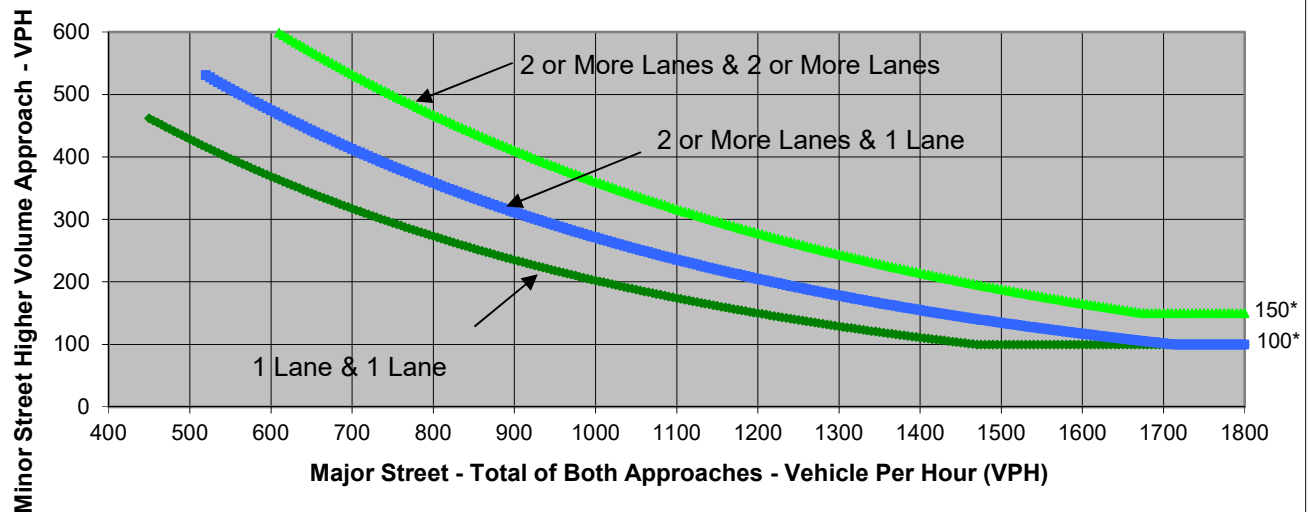
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	498	0	120
Through	53	127	0	0
Right	50	0	0	531
Total	103	625	0	651

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	728	651	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



# FEHR & PEERS

Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative with Phase 2 Conditions
Peak Hour	AM

## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	498	0	120
Through	53	127	0	0
Right	50	0	0	531
Total	103	625	0	651

## Major Street Direction

x	North/South
	East/West

## Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

## Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	391.9
Approach with Worst Case Delay	WB
Total Vehicles on Approach	651

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Phase 2 Condition	70.9	651	1,379
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Cumulative Conditions  
Peak Hour PM

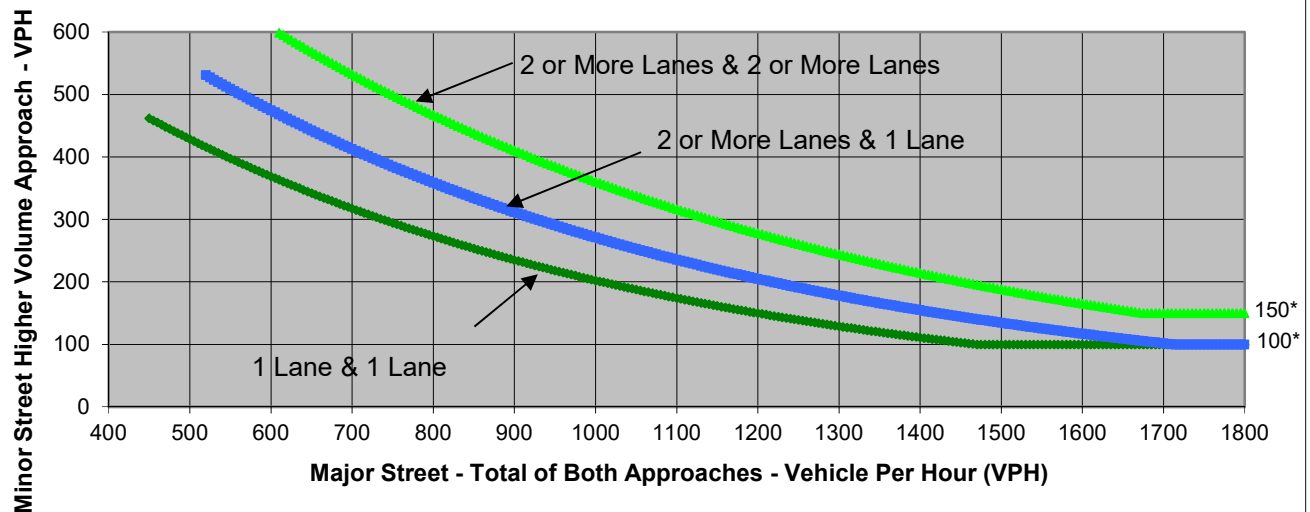
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	410	0	80
Through	110	100	0	0
Right	120	0	0	580
Total	230	510	0	660

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	740	660	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative Conditions
Peak Hour	PM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	410	0	80
Through	110	100	0	0
Right	120	0	0	580
Total	230	510	0	660

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	202.7
Approach with Worst Case Delay	WB
Total Vehicles on Approach	660

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative Conditions	37.2	660	1,400
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		



Major Street Deer Valley Road  
 Minor Street Balfour Road

Project The Ranch  
 Scenario Cumulative with Project Conditions  
 Peak Hour PM

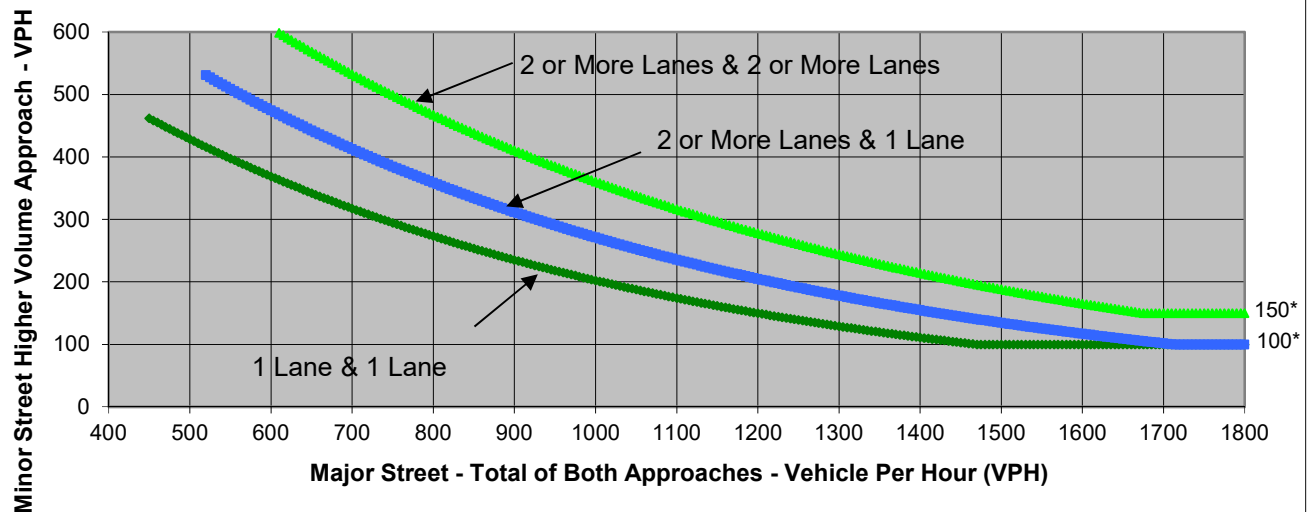
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	441	0	80
Through	123	109	0	0
Right	120	0	0	627
Total	243	550	0	707

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	793	707	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative with Project Conditions
Peak Hour	PM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	441	0	80
Through	123	109	0	0
Right	120	0	0	627
Total	243	550	0	707

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	289.9
Approach with Worst Case Delay	WB
Total Vehicles on Approach	707

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Project Condition	56.9	707	1,500
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		



Major Street Deer Valley Road  
 Minor Street Balfour Road

Project The Ranch  
 Scenario Cumulative with Phase 1 Conditions  
 Peak Hour PM

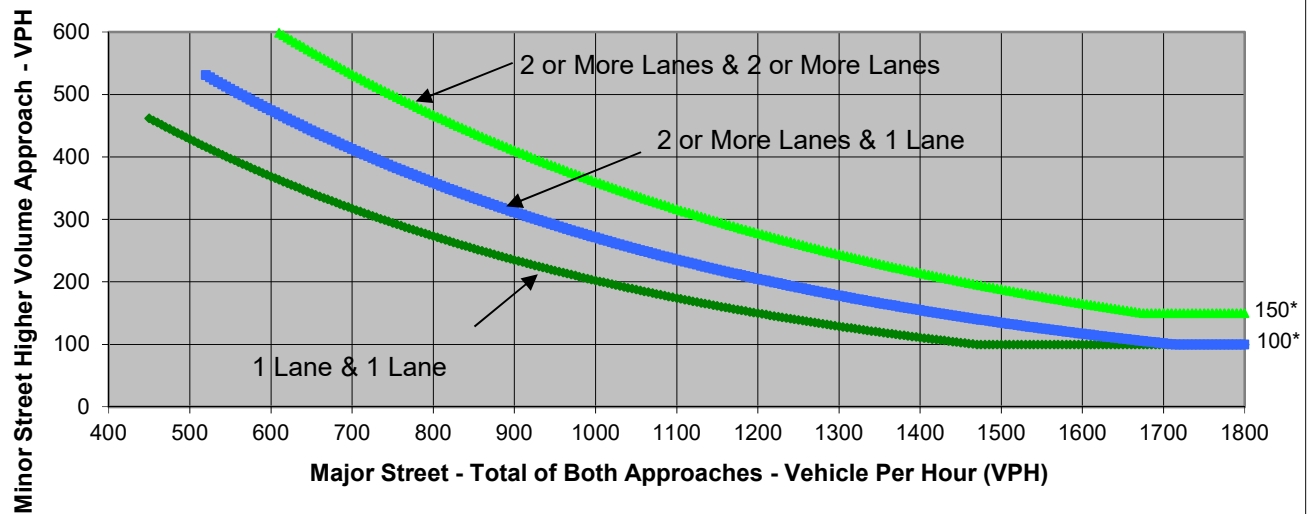
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	427	0	80
Through	117	105	0	0
Right	120	0	0	607
Total	237	532	0	687

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	769	687	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative with Phase 1 Conditions
Peak Hour	PM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	427	0	80
Through	117	105	0	0
Right	120	0	0	607
Total	237	532	0	687

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	247.7
Approach with Worst Case Delay	WB
Total Vehicles on Approach	687

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Phase 1 Condition	47.3	687	1,456
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		





Major Street Deer Valley Road  
 Minor Street Balfour Road

Project The Ranch  
 Scenario Cumulative with Phase 2 Conditions  
 Peak Hour PM

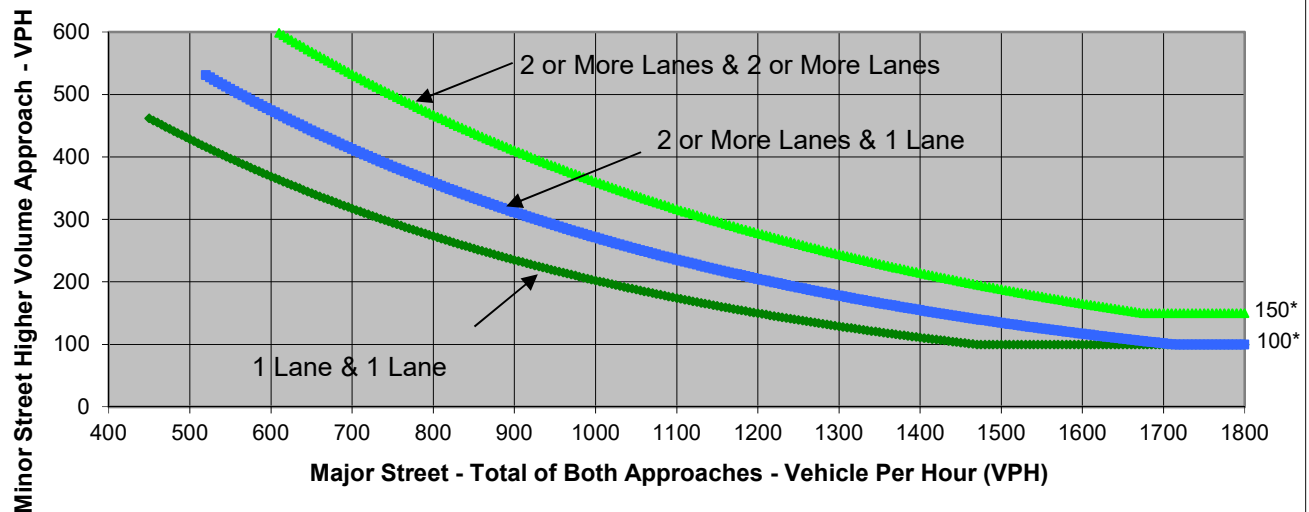
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	433	0	80
Through	120	107	0	0
Right	120	0	0	617
Total	240	540	0	697

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	780	697	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative with Phase 2 Conditions
Peak Hour	PM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	433	0	80
Through	120	107	0	0
Right	120	0	0	617
Total	240	540	0	697

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	267.7
Approach with Worst Case Delay	WB
Total Vehicles on Approach	697

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Phase 2 Condition	51.8	697	1,477
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Existing Conditions  
Peak Hour AM

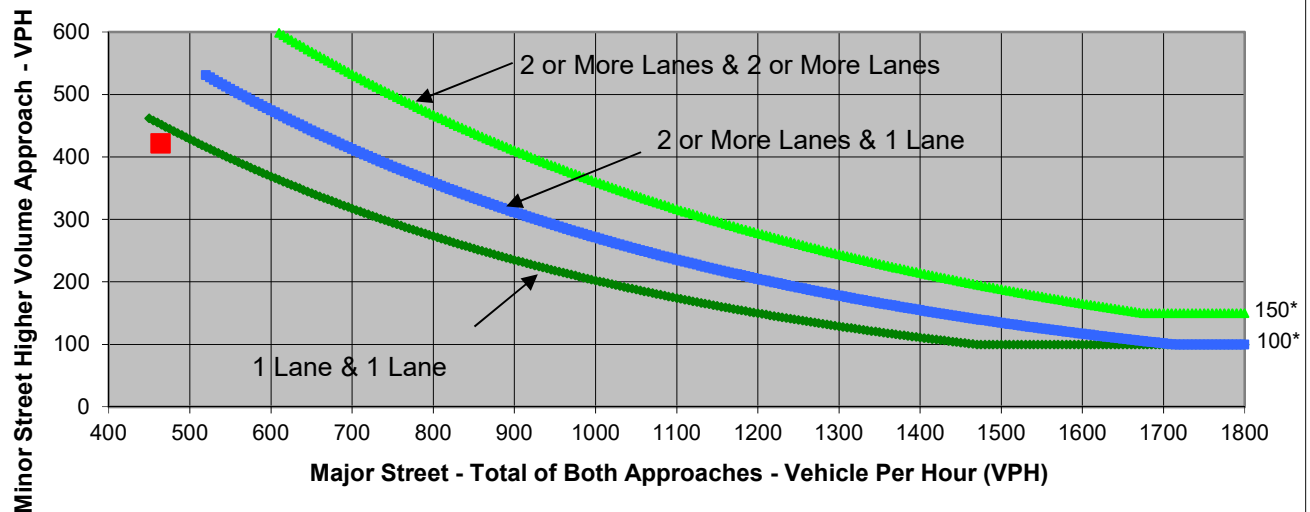
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	373	0	79
Through	23	38	0	0
Right	30	0	0	343
Total	53	411	0	422

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	464	422	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street Deer Valley Road  
 Minor Street Balfour Road

Project The Ranch  
 Scenario Existing with Project Conditions  
 Peak Hour AM

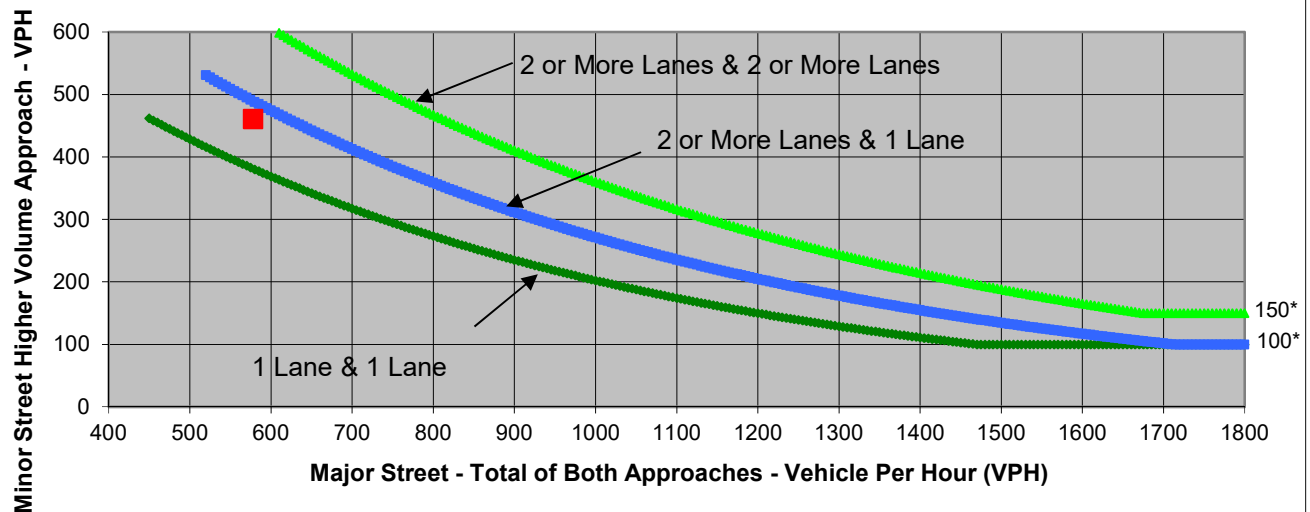
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	473	0	79
Through	27	48	0	0
Right	30	0	0	382
Total	57	521	0	461

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	578	461	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street Deer Valley Road  
 Minor Street Balfour Road

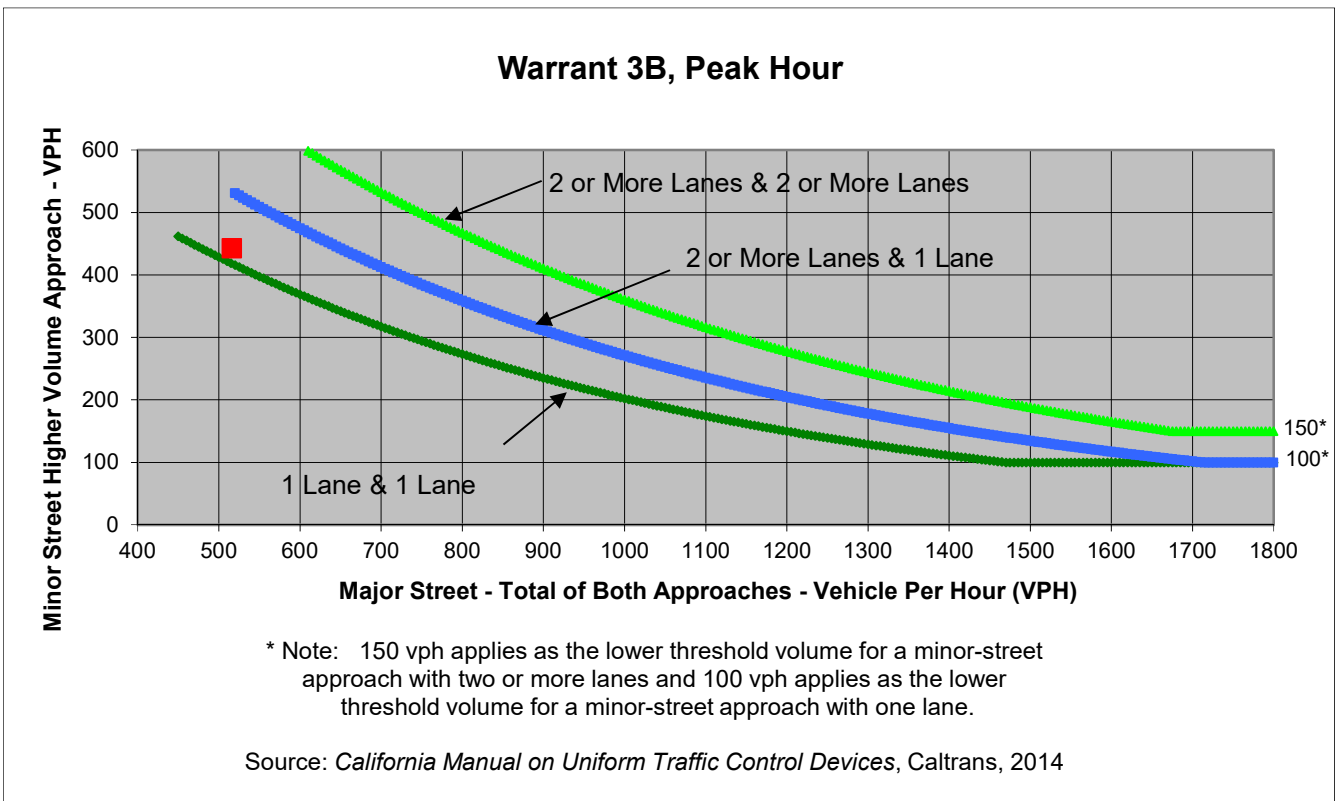
Project The Ranch  
 Scenario Existing with Phase 1 Conditions  
 Peak Hour AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	422	0	79
Through	26	38	0	0
Right	30	0	0	364
Total	56	460	0	443

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	516	443	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Existing with Phase 2 Conditions  
Peak Hour AM

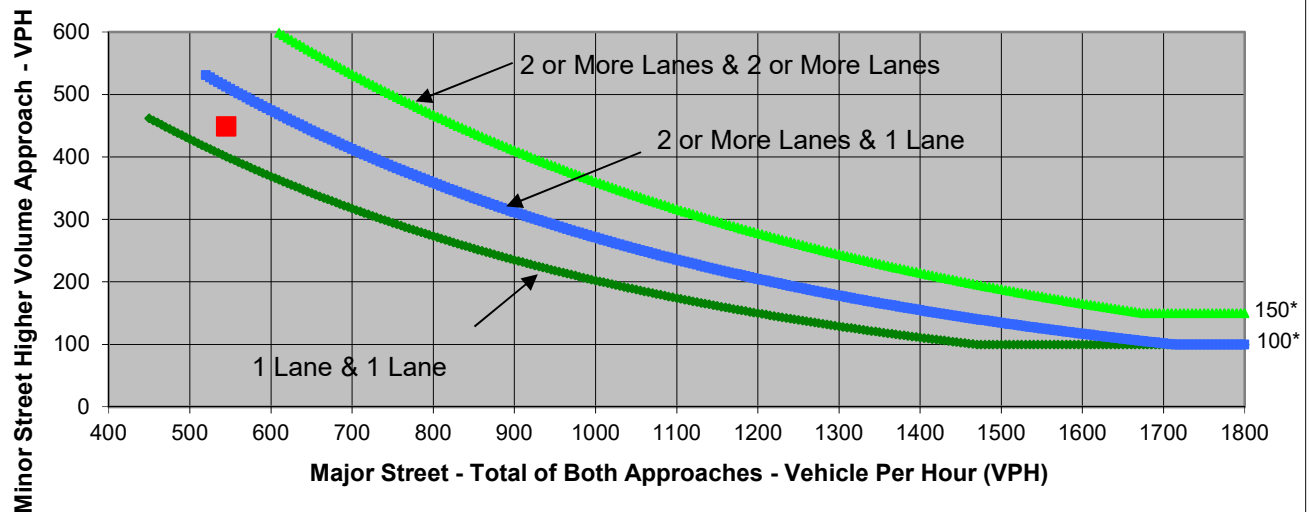
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	444	0	79
Through	26	45	0	0
Right	30	0	0	370
Total	56	489	0	449

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	545	449	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

Project **The Ranch**  
 Scenario **Near Term Conditions**  
 Peak Hour **AM**

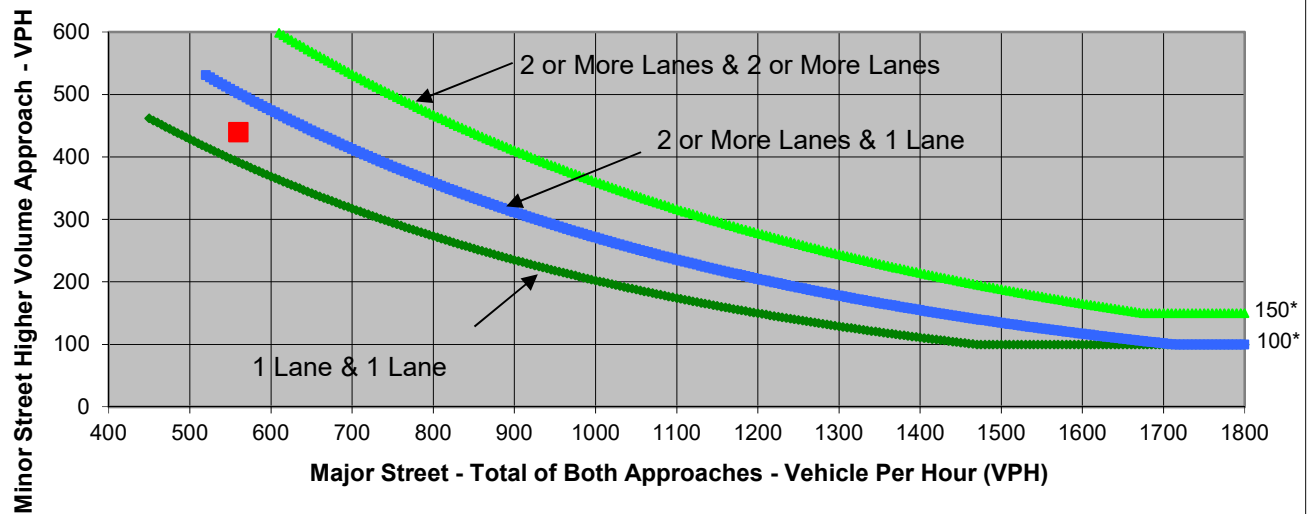
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	390	0	80
Through	40	100	0	0
Right	30	0	0	360
Total	70	490	0	440

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	<b>1</b>	<b>1</b>	<b><u>YES</u></b>
Traffic Volume (VPH) *	<b>560</b>	<b>440</b>	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.





Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

Project **The Ranch**  
 Scenario **Near Term with Project Conditions**  
 Peak Hour **AM**

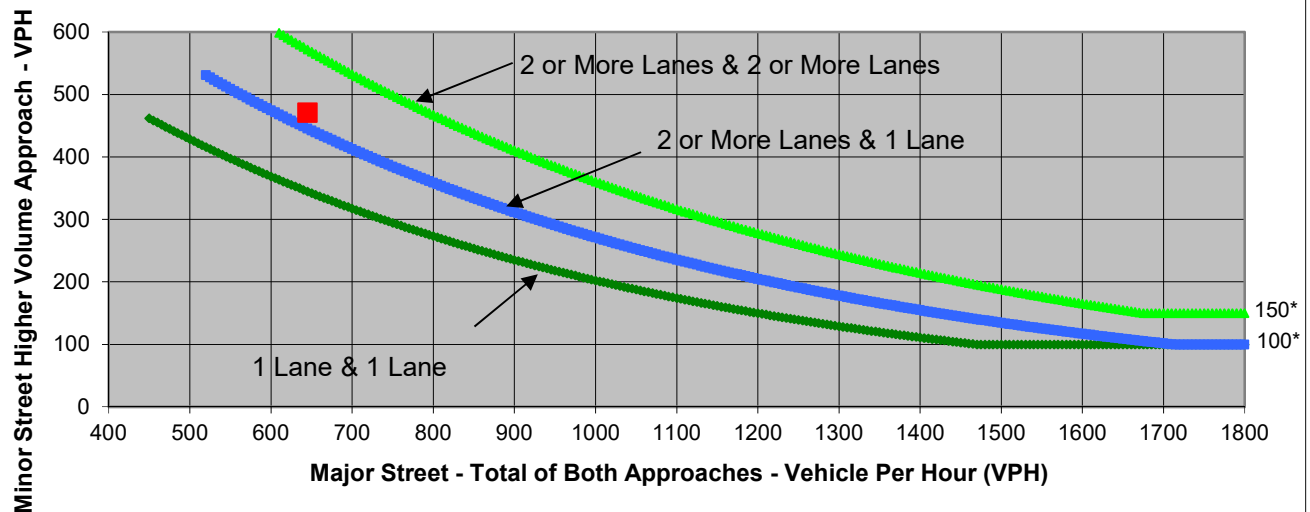
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	461	0	80
Through	44	110	0	0
Right	30	0	0	391
Total	74	571	0	471

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<b>YES</b>
Traffic Volume (VPH) *	645	471	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

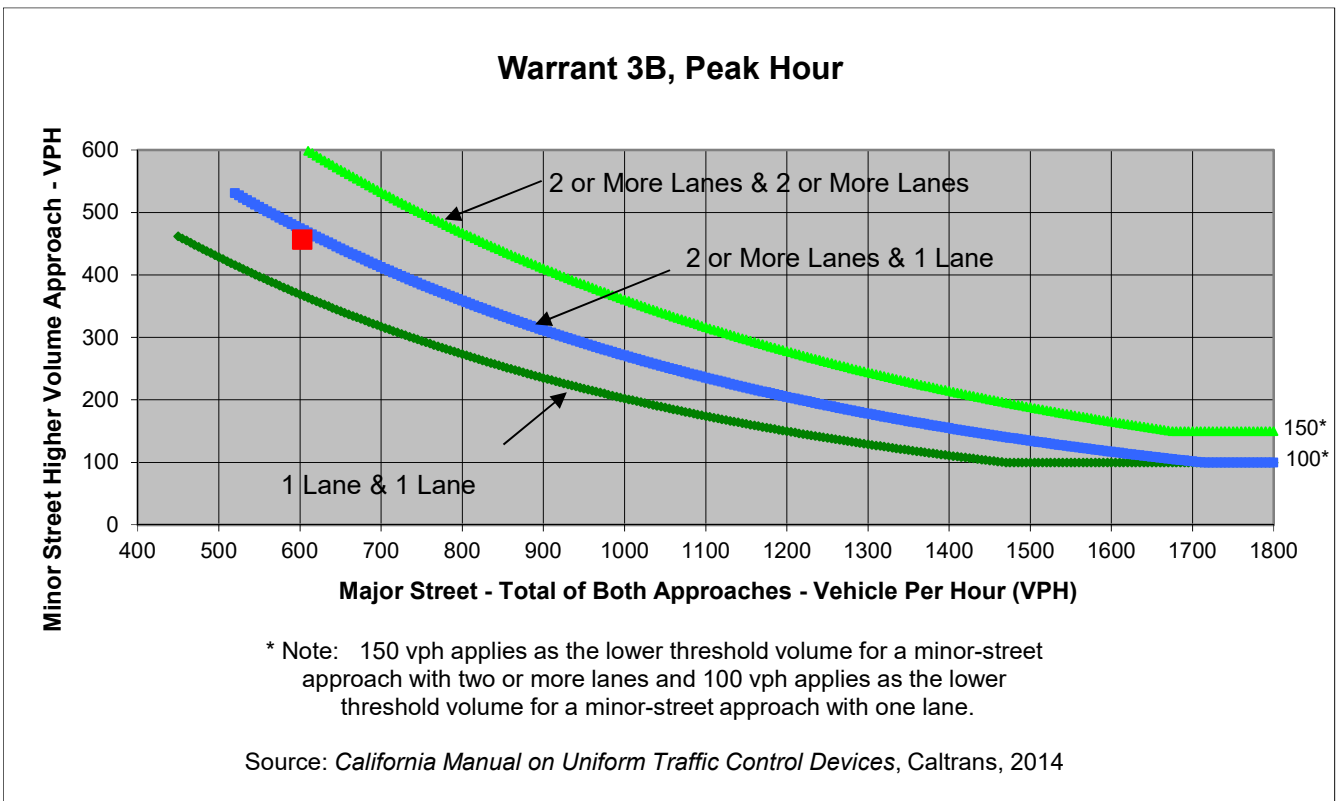
Project **The Ranch**  
 Scenario **Near Term with Phase 1 Conditions**  
 Peak Hour **AM**

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	425	0	80
Through	43	105	0	0
Right	30	0	0	377
Total	73	530	0	457

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	603	457	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

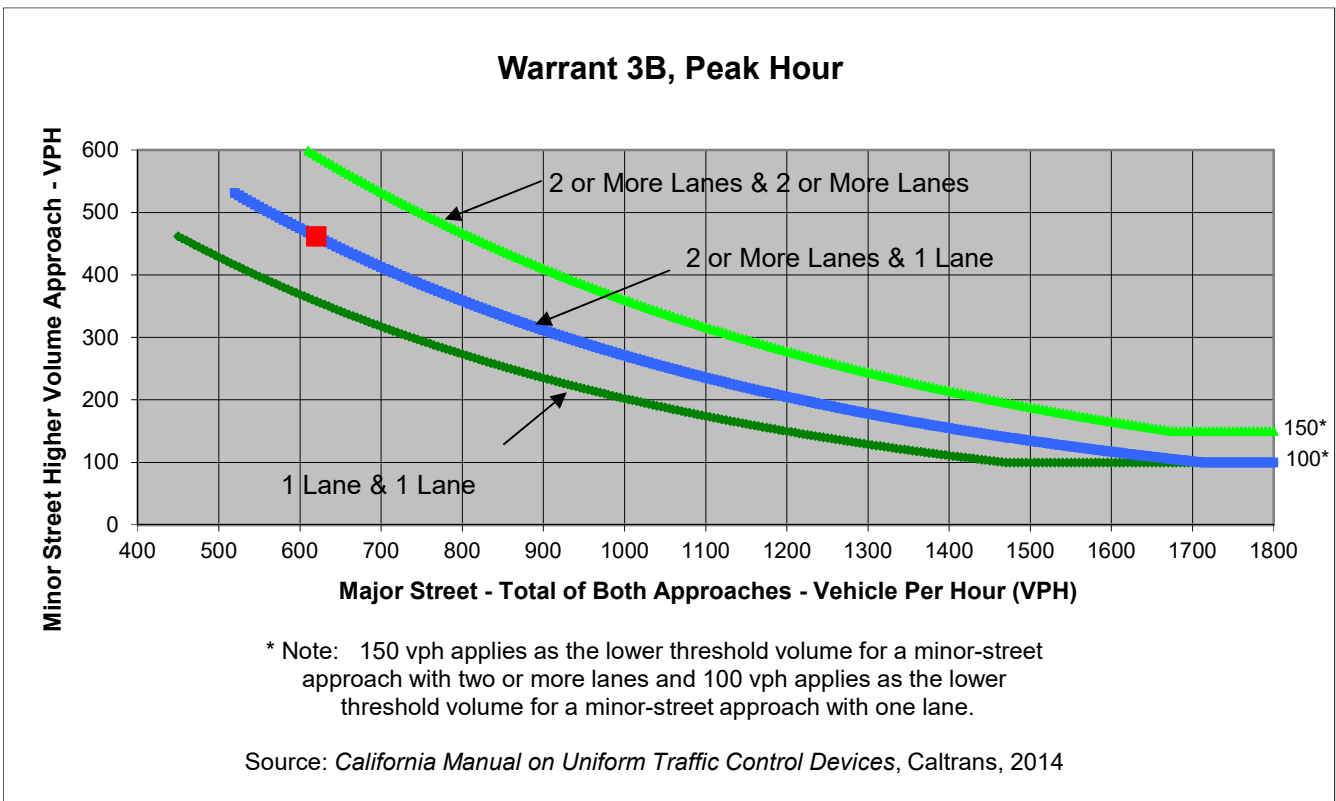
Project **The Ranch**  
 Scenario **Near Term with Phase 2 Conditions**  
 Peak Hour **AM**

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	440	0	80
Through	43	107	0	0
Right	30	0	0	382
Total	73	547	0	462

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	620	462	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

Project **The Ranch**  
 Scenario **Near Term with Project Conditions**  
 Peak Hour **PM**

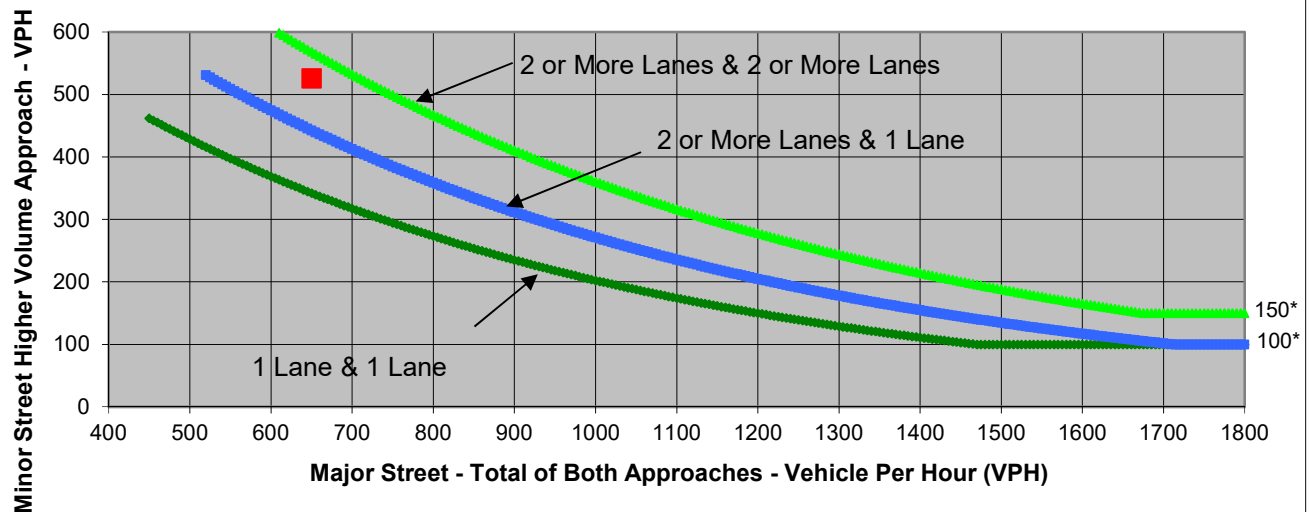
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	398	0	40
Through	113	89	0	0
Right	50	0	0	486
Total	163	487	0	526

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	650	526	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street Deer Valley Road  
 Minor Street Balfour Road

Project The Ranch  
 Scenario Near Term with Project Conditions  
 Peak Hour PM

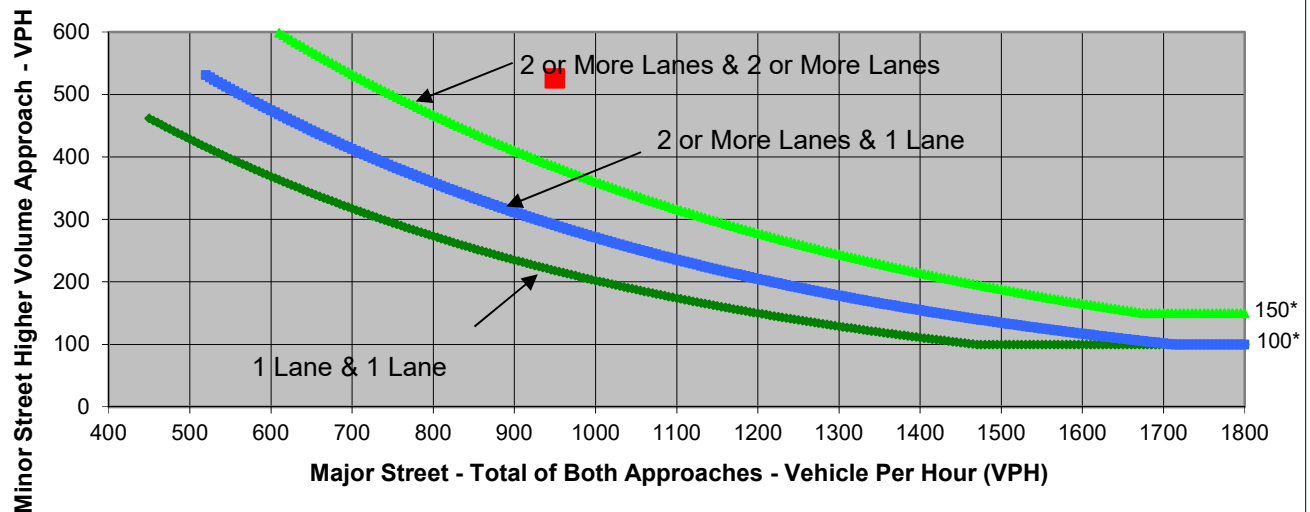
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	698	0	40
Through	113	89	0	0
Right	50	0	0	486
Total	163	787	0	526

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	950	526	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

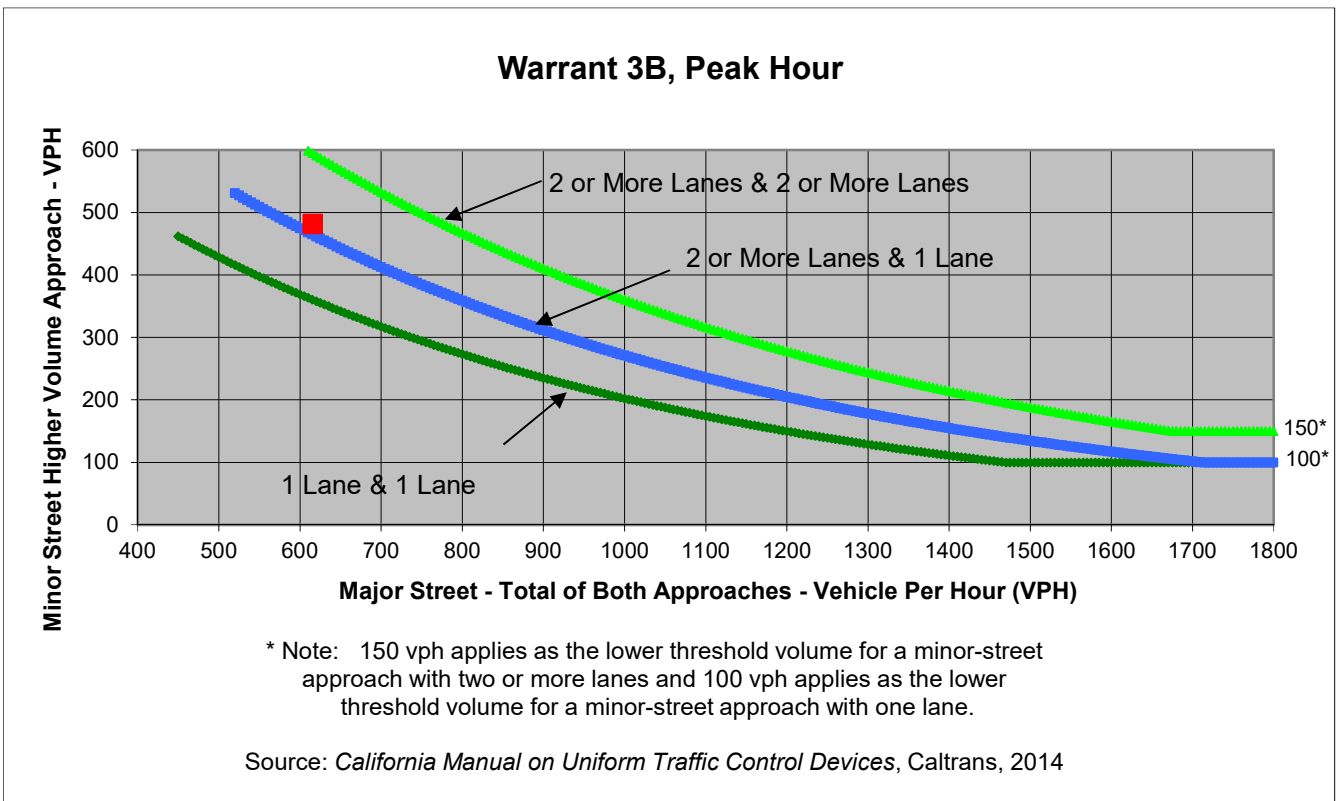
Project **The Ranch**  
 Scenario **Near Term with Phase 1 Conditions**  
 Peak Hour **PM**

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	374	0	40
Through	107	85	0	0
Right	50	0	0	442
Total	157	459	0	482

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
<b>Number of Approach Lanes</b>	<b>1</b>	<b>1</b>	<b><u>YES</u></b>
<b>Traffic Volume (VPH) *</b>	<b>616</b>	<b>482</b>	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Near Term with Phase 2 Conditions  
Peak Hour PM

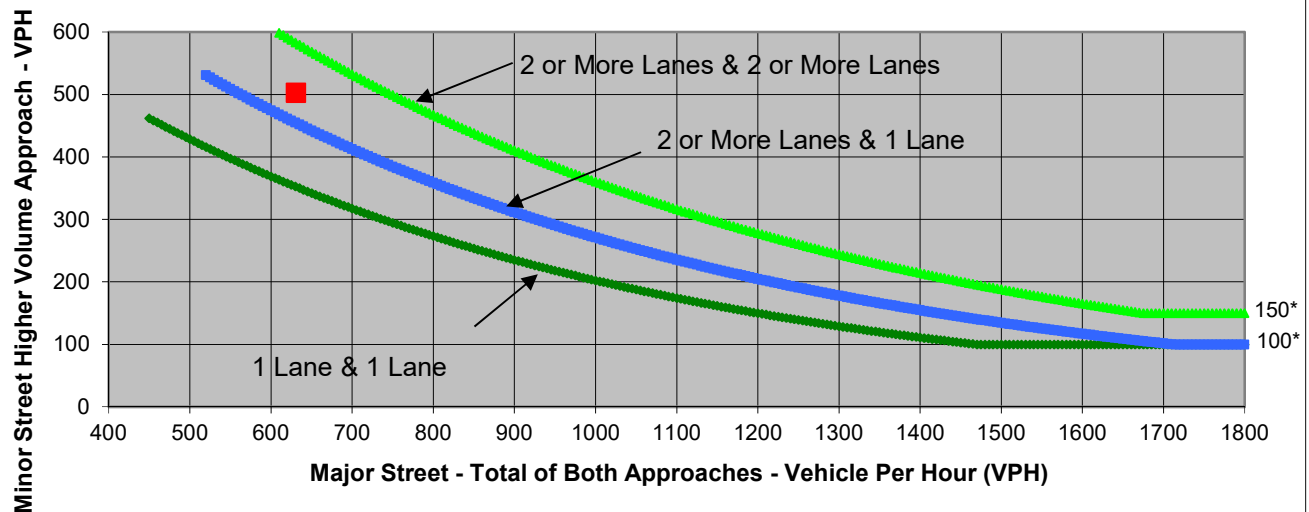
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	384	0	40
Through	110	87	0	0
Right	50	0	0	463
Total	160	471	0	503

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	631	503	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

Project **The Ranch**  
 Scenario **Cumulative Conditions**  
 Peak Hour **AM**

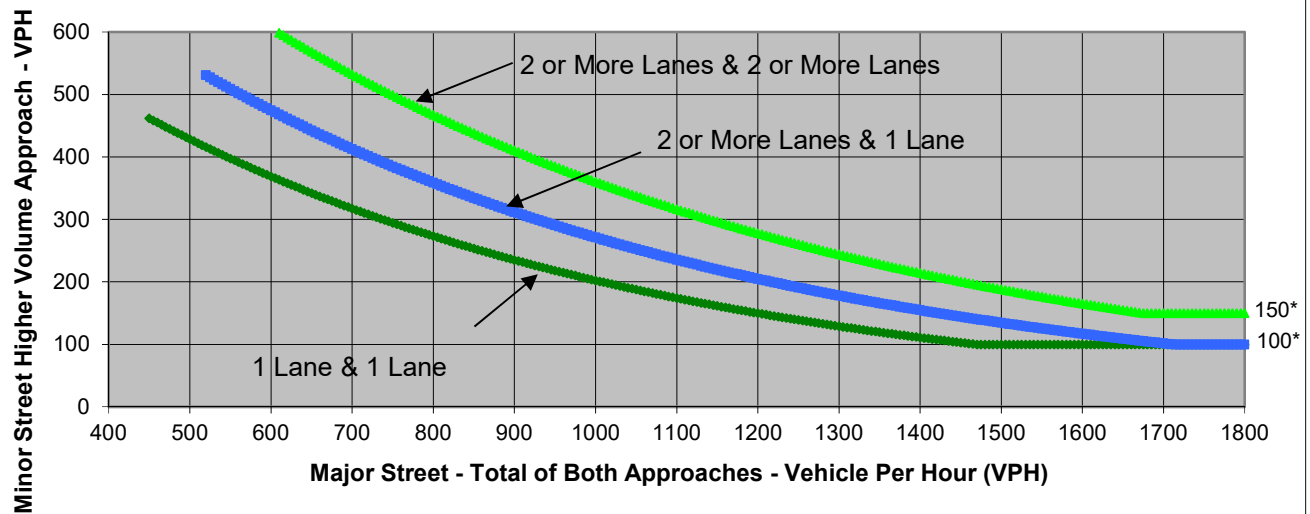
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	470	0	120
Through	50	120	0	0
Right	50	0	0	520
Total	100	590	0	640

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	690	640	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			





Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative Conditions
Peak Hour	AM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	470	0	120
Through	50	120	0	0
Right	50	0	0	520
Total	100	590	0	640

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	315.2
Approach with Worst Case Delay	WB
Total Vehicles on Approach	640

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative Conditions	56	640	1,330
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Cumulative with Project Conditions  
Peak Hour AM

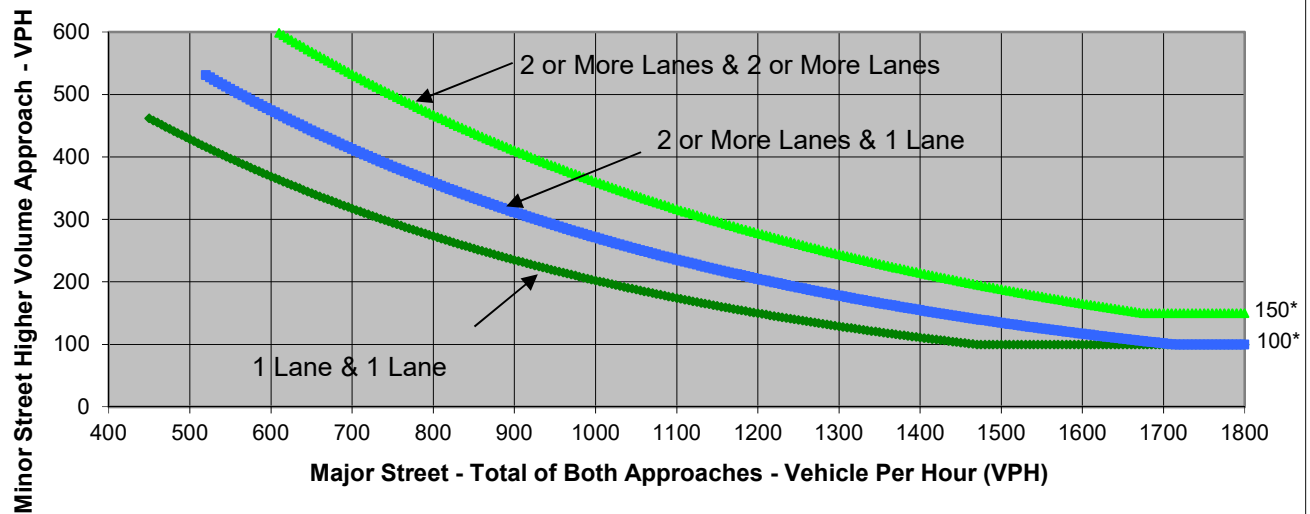
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	510	0	120
Through	54	130	0	0
Right	50	0	0	535
Total	104	640	0	655

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	744	655	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

# FEHR & PEERS

Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative with Project Conditions
Peak Hour	AM

## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	510	0	120
Through	54	130	0	0
Right	50	0	0	535
Total	104	640	0	655

## Major Street Direction

x	North/South
	East/West

## Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

## Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	426.9
Approach with Worst Case Delay	WB
Total Vehicles on Approach	655

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Project Condition	77.7	655	1,399
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

Project **The Ranch**  
 Scenario **Cumulative with Phase 1 Conditions**  
 Peak Hour **AM**

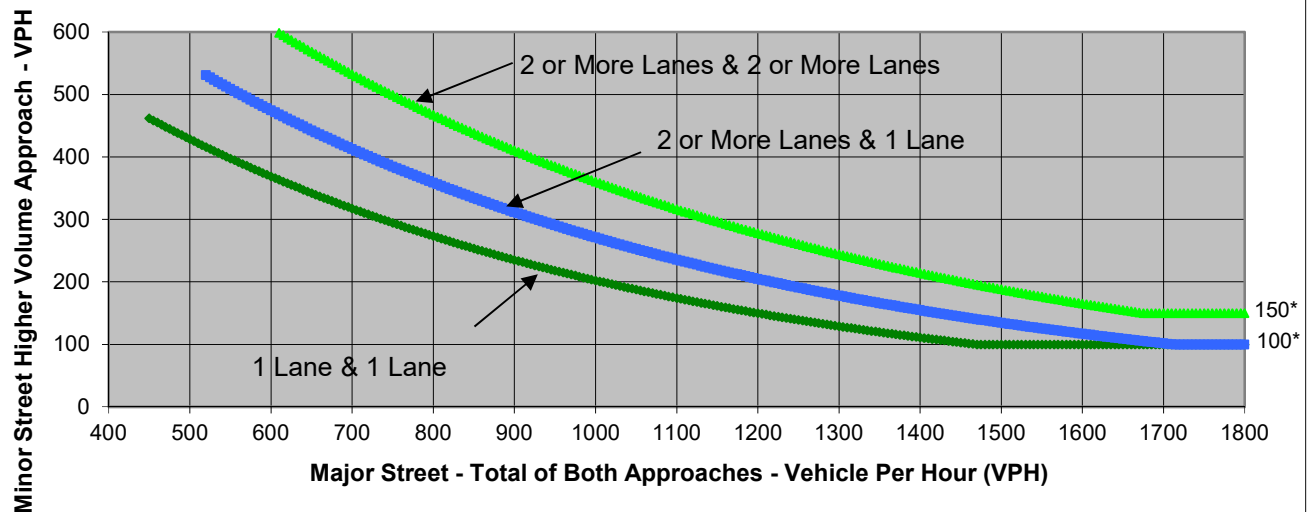
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	489	0	120
Through	53	125	0	0
Right	50	0	0	529
Total	103	614	0	649

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	717	649	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative with Phase 1 Conditions
Peak Hour	AM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	489	0	120
Through	53	125	0	0
Right	50	0	0	529
Total	103	614	0	649

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	371.3
Approach with Worst Case Delay	WB
Total Vehicles on Approach	649

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Phase 1 Condition	66.9	649	1,366
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street **Deer Valley Road**  
 Minor Street **Balfour Road**

Project **The Ranch**  
 Scenario **Cumulative with Phase 2 Conditions**  
 Peak Hour **AM**

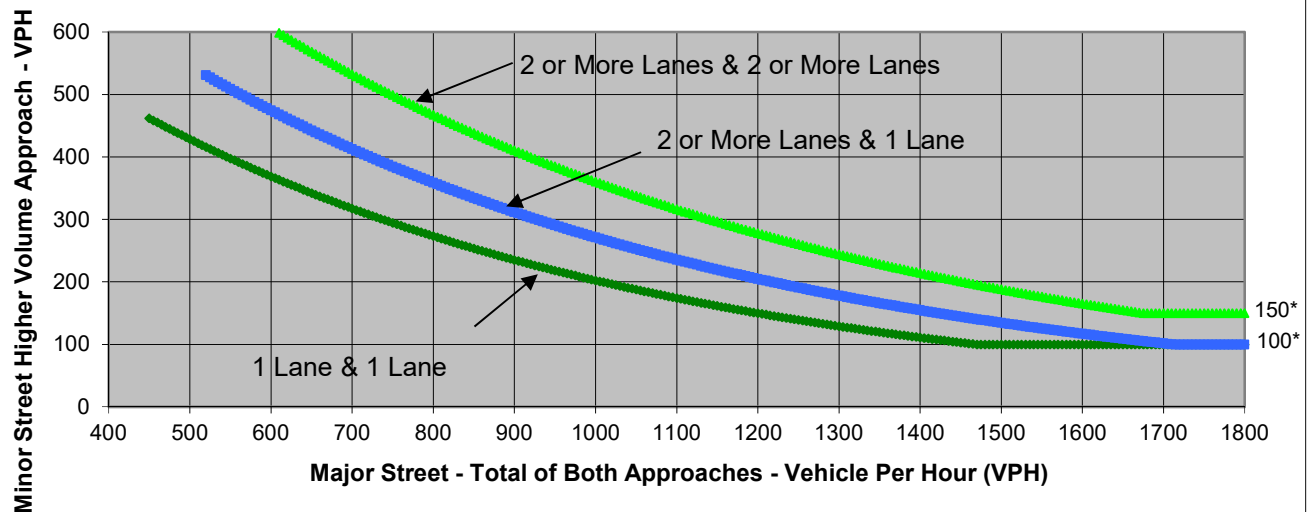
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	498	0	120
Through	53	127	0	0
Right	50	0	0	531
Total	103	625	0	651

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	728	651	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative with Phase 2 Conditions
Peak Hour	AM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	498	0	120
Through	53	127	0	0
Right	50	0	0	531
Total	103	625	0	651

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	391.9
Approach with Worst Case Delay	WB
Total Vehicles on Approach	651

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Phase 2 Condition	70.9	651	1,379
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Cumulative Conditions  
Peak Hour PM

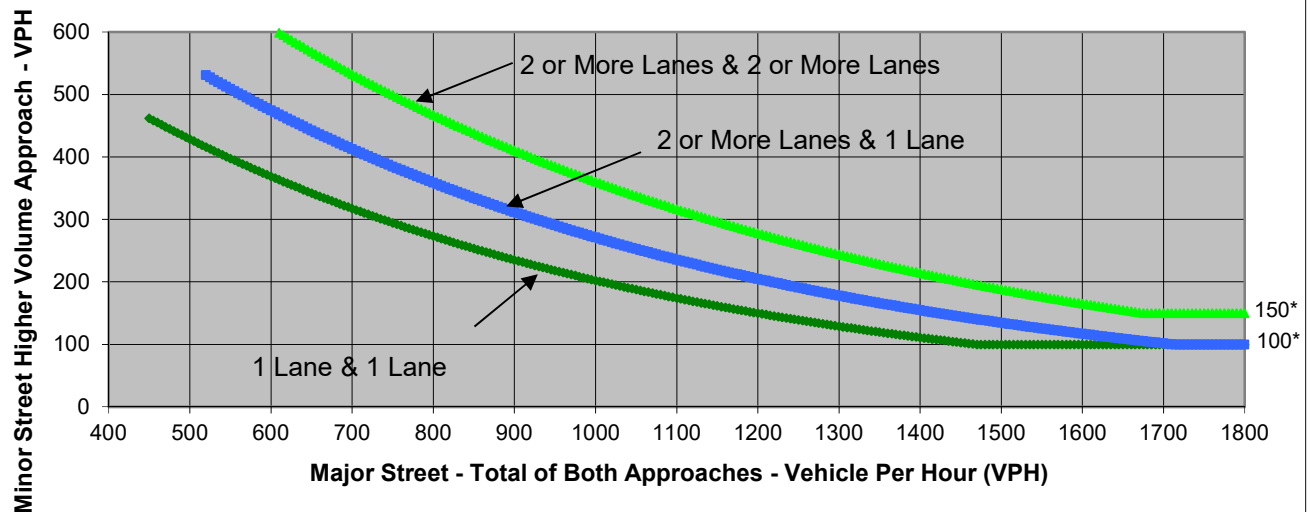
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	410	0	80
Through	110	100	0	0
Right	120	0	0	580
Total	230	510	0	660

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	740	660	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			





Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative Conditions
Peak Hour	PM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	410	0	80
Through	110	100	0	0
Right	120	0	0	580
Total	230	510	0	660

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	202.7
Approach with Worst Case Delay	WB
Total Vehicles on Approach	660

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative Conditions	37.2	660	1,400
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Cumulative with Project Conditions  
Peak Hour PM

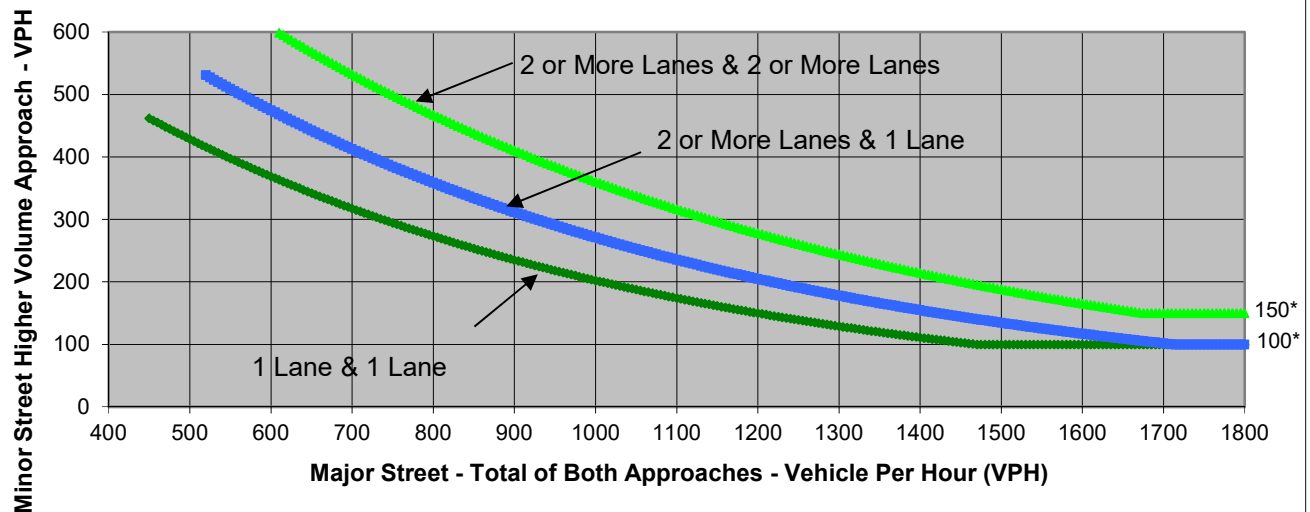
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	441	0	80
Through	123	109	0	0
Right	120	0	0	627
Total	243	550	0	707

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	793	707	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative with Project Conditions
Peak Hour	PM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	441	0	80
Through	123	109	0	0
Right	120	0	0	627
Total	243	550	0	707

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	289.9
Approach with Worst Case Delay	WB
Total Vehicles on Approach	707

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Project Condition	56.9	707	1,500
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		



Major Street Deer Valley Road  
 Minor Street Balfour Road

Project The Ranch  
 Scenario Cumulative with Phase 1 Conditions  
 Peak Hour PM

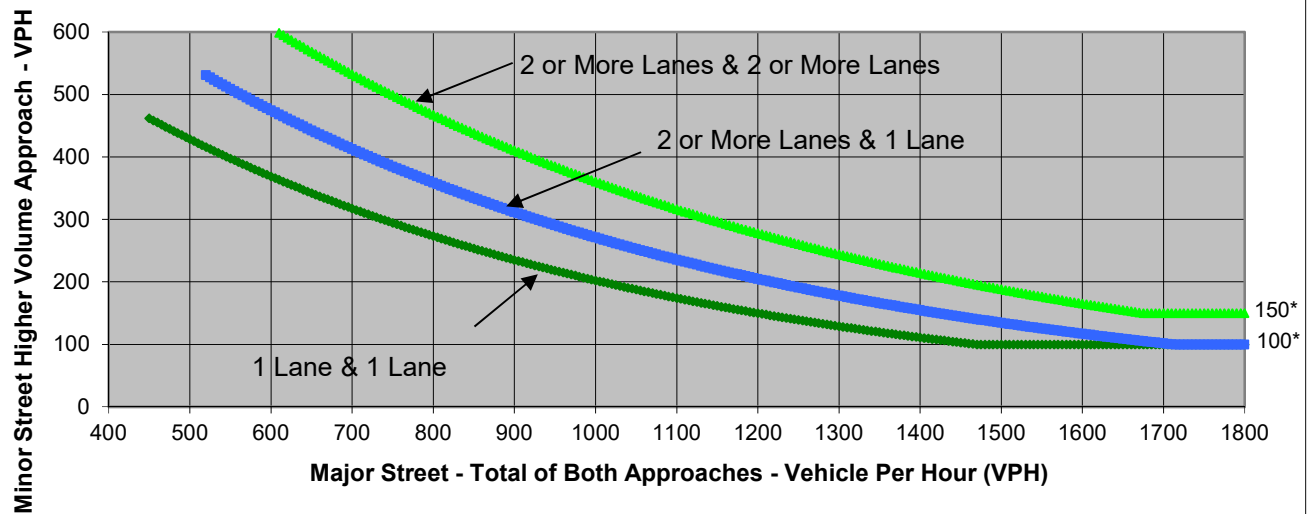
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	427	0	80
Through	117	105	0	0
Right	120	0	0	607
Total	237	532	0	687

Major Street Direction

x	North/South
	East/West

**Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	769	687	

\* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.  
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative with Phase 1 Conditions
Peak Hour	PM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	427	0	80
Through	117	105	0	0
Right	120	0	0	607
Total	237	532	0	687

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street

1

Total Approaches

3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)

247.7

Approach with Worst Case Delay

WB

Total Vehicles on Approach

687

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Phase 1 Condition	47.3	687	1,456
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street Deer Valley Road  
Minor Street Balfour Road

Project The Ranch  
Scenario Cumulative with Phase 2 Conditions  
Peak Hour PM

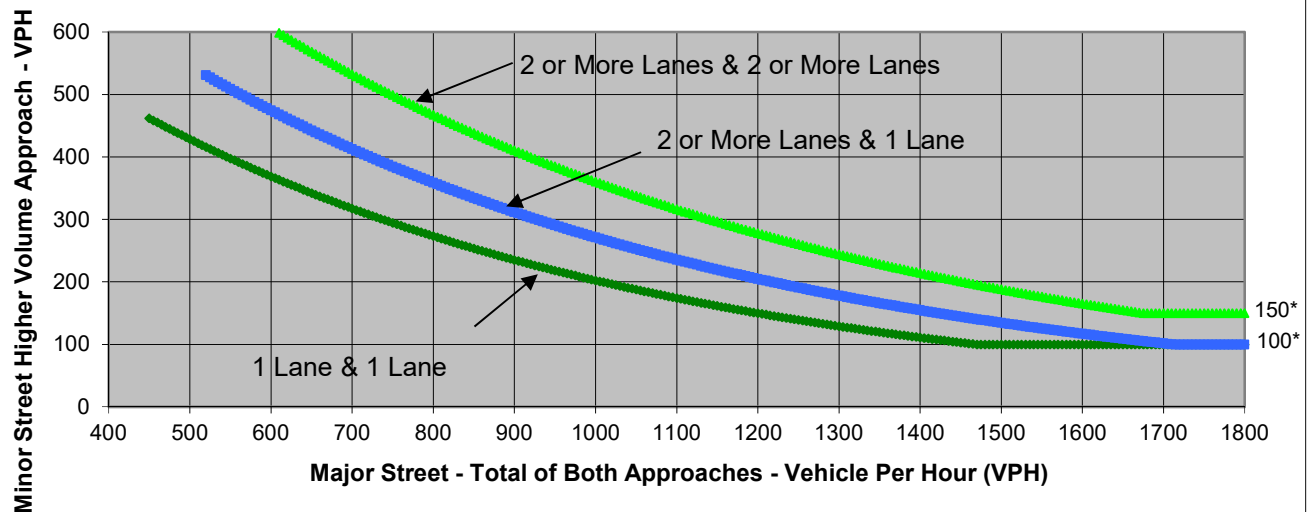
## Turn Movement Volumes

	NB	SB	EB	WB
Left	0	433	0	80
Through	120	107	0	0
Right	120	0	0	617
Total	240	540	0	697

## Major Street Direction

x	North/South
	East/West

## Warrant 3B, 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.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Deer Valley Road	Balfour Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	780	697	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	Deer Valley Road
Minor Street	Balfour Road

Project	The Ranch
Scenario	Cumulative with Phase 2 Conditions
Peak Hour	PM

#### Turn Movement Volumes

	NB	SB	EB	WB
Left	0	433	0	80
Through	120	107	0	0
Right	120	0	0	617
Total	240	540	0	697

#### Major Street Direction

x	North/South
	East/West

#### Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

#### Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	267.7
Approach with Worst Case Delay	WB
Total Vehicles on Approach	697

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Phase 2 Condition	51.8	697	1,477
Limiting Value	4	100	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

## Appendix D: Vehicle Queue Summary



Int #	Intersection	Movement	Storage Length (ft)	Existing AM		Existing PM		Existing Plus Project AM		Existing Plus Project PM	
				Average Queue	95th Percentile Queue (ft)	Average Queue	95th Percentile Queue (ft)	Average Queue	95th Percentile Queue (ft)	Average Queue	95th Percentile Queue (ft)
1	Lone Tree Way & State Route 4 (Westbound Ramps)	WBL	325	75	125	25	75	75	125	50	75
		WBR	325	75	200	25	75	100	225	25	75
		NBL	300	200	375	75	175	250	475	100	200
		NBT	300	100	175	50	75	100	175	50	75
		SBT	475	100	175	50	75	125	175	50	75
2	Lone Tree Way & State Route 4 (Eastbound Ramps)	EBL	350	125	150	100	125	125	150	100	125
		EBR	350	450	625	625	975	550	700	975	1,250
		NBT	300	350	425	275	325	450	500	325	375
		SBL	300	150	200	125	225	150	200	150	225
		SBT	300	200	275	175	250	225	275	200	250
3	Hillcrest Avenue & Sunset Drive/Slatten Ranch	EBL	600	25	50	25	75	25	50	25	75
		EBT	600	25	50	25	75	25	50	25	75
		WBL	475	75	175	100	275	75	175	125	300
		WBT	675	75	150	75	200	75	150	75	200
		NBL	225	125	350	75	200	125	350	75	200
		NBT	225	75	175	125	225	75	175	125	225
		NBR	225	25	25	25	50	25	25	25	50
		SBL	225	25	75	25	125	25	75	25	125
		SBT	450	175	300	125	275	175	300	125	275
		NBR	175	25	50	25	50	25	50	25	50
4	SR 4 EB Ramps & Slatten Ranch	EBT	675	25	50	25	50	25	50	25	50
		EBR	675	25	75	25	75	25	75	25	75
		WBL	550	25	25	25	25	25	25	25	25
		WBT	550	50	75	75	175	50	75	75	175
		NBL	175	25	100	50	125	25	100	50	125
5	Hillcrest Avenue & State Route 4 Eastbound Ramps	NBR	175	25	50	25	50	25	50	25	50
		EBL	725	50	100	100	150	75	100	100	175
		EBR	725	50	125	250	475	75	150	325	575
		NBT	525	300	450	350	450	350	475	375	500
		SBL	375	50	100	125	175	75	100	125	200
6	Lone Tree Way & Davison Drive	SBT	200	50	75	75	100	50	75	75	100
		EBT	100	50	100	50	150	50	100	75	175
		EBR	100	25	25	25	50	25	25	25	50
		WBL	275	150	325	75	200	175	325	75	225
		WBT	275	25	75	25	75	50	75	25	75
7	Deer Valley Road & Davison Drive & Hillcrest Avenue	WBR	100	25	100	25	75	25	100	25	75
		NBL	100	25	75	50	125	25	75	50	125
		NBT	500	375	800	175	475	475	1,050	225	575
		SBL	200	75	150	50	150	75	150	50	175
		SBT	275	200	450	200	525	225	500	250	650
8	Lone Tree Way & James Donlon Boulevard/Ridgerock Drive	EBL	200	125	250	150	250	125	250	150	250
		EBT	300	50	100	75	125	50	100	75	125
		WBL	225	50	100	50	100	50	100	50	100
		WBT	475	200	325	150	225	200	325	150	225
		WBR	475	200	375	150	275	200	375	150	275
		NBL	250	50	125	100	200	50	125	100	200
		NBT	575	275	425	325	475	300	450	325	475
		SBL	250	200	300	300	575	200	325	300	575
		SBT	675	325	500	350	525	350	525	375	575
		NBR	175	25	25	25	25	25	25	25	25
9	Dallas Ranch Road/Eagleridge Drive & Lone Tree Way	SBL	175	50	125	50	125	50	125	50	125
		SBT	400	175	325	200	425	200	350	225	525
		EBL	225	50	100	100	175	50	100	100	175
		EBT	350	350	425	350	475	350	425	375	475
		EBR	75	50	125	100	200	100	200	225	375
		WBL	225	175	275	100	175	175	275	100	175
		WBT	350	400	475	225	325	450	525	275	350
		WBR	75	25	25	25	25	25	25	25	25
		NBL	225	150	225	100	150	225	350	125	225
		NBT	425	100	175	50	75	100	175	50	75
10	Deer Valley Road & Lone Tree Way	NBR	125	25	50	25	50	25	50	25	50
		SBL	400	75	125	50	100	75	125	50	100
		SBT	400	225	350	25	75	225	350	25	75
		EBL	225	50	75	75	125	50	75	75	125
		EBT	500	300	375	300	400	325	375	325	400
11	Hillcrest Avenue & Lone Tree Way	EBR	325	25	75	25	75	25	75	25	75
		WBL	525	225	300	175	250	275	400	300	525
		WBT	900	275	300	175	225	275	300	175	225
		WBR	525	25	50	25	50	25	50	25	50
		NBL	200	175	225	100	150	225	300	125	175
		NBT	400	150	225	150	225	225	275	200	275
		SBL	375	150	200	125	175	175	200	125	175
		SBT	375	250	325	100	150	275	325	150	200
		EBL	625	75	350	100	325	75	375	100	350
		EBT	850	75	225	200	450	75	275	225	475
12	SR 4 Eastbound & Lone Tree	EBR	275	25	75	25	25	25	25	25	25
		WBL	275	25	75	50	125	25	75	50	125
		WBT	425	100	250	150	300	100	250	175	325
		WBR	425	25	50	25	75	25	50	25	75
		NBL	250	25	75	25	75	25	75	25	75
12	SR 4 Eastbound & Lone Tree	NBT	475	25	50	25	50	25	50	25	50
		SBL	625	75	300	125	425	75	300	150	425
		SBT	925	25	50	25	50	25	50	25	50
		EBT	675	225	375	525	625	250	375	550	650
		EBR	675	225	375	525	625	250	375	550	650

Int #	Intersection	Movement	Storage Length (ft)	Existing AM		Existing PM		Existing Plus Project AM		Existing Plus Project PM	
				Average Queue (ft)	95th Percentile Queue (ft)	Average Queue (ft)	95th Percentile Queue (ft)	Average Queue (ft)	95th Percentile Queue (ft)	Average Queue (ft)	95th Percentile Queue (ft)
	Way	EBR	325	25	100	75	250	25	100	100	275
		WBL	175	75	175	150	225	75	175	150	225
		WBT	700	225	375	400	475	250	375	450	500
		SBL	150	100	175	225	325	100	175	225	325
		SBT	150	100	175	225	325	100	175	225	325
13	SR 4 Westbound & Lone Tree Way	EBT	700	125	275	300	525	125	275	325	550
		EBR	225	25	75	50	200	25	75	75	200
		WBL	300	25	75	25	75	25	75	25	75
		WBT	600	75	175	125	200	75	175	125	225
		WBR	175	25	75	25	50	25	75	25	50
		NBL	200	100	225	225	325	100	225	250	350
		NBT	400	100	225	225	325	100	225	225	350
		NBR	400	25	50	25	100	25	50	25	100
14	Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road	EBL	100	25	75	25	75	25	75	25	75
		EBT	325	50	100	25	75	50	100	25	75
		WBL	225	25	25	25	25	25	50	25	50
		WBT	400	125	250	25	125	125	250	50	125
		NBL	175	25	25	25	25	25	25	25	50
		NBT	750	50	75	25	50	100	150	50	100
		SBL	225	125	300	50	225	125	300	75	225
		SBT	350	25	50	25	50	50	75	50	150
15	Deer Valley Road & Prewett Ranch Drive	EBL	175	100	175	25	100	100	175	50	100
		EBT	450	225	375	50	150	250	375	75	175
		WBL	100	175	325	25	75	175	325	25	75
		WBT	500	175	275	50	150	175	275	75	150
		NBL	175	75	175	50	150	75	175	50	175
		NBT	550	200	300	100	250	300	425	150	350
		SBL	175	75	125	50	150	75	125	50	150
		SBT	350	325	450	75	225	375	525	150	350
16	Deer Valley Road & Wellness Way	EBL	25					75	175	50	150
		EBT	25					25	25	25	25
		WBL	250	25	25	25	50	25	25	25	50
		WBT	25							50	125
		WBR	250	25	50	25	50	25	25		
		NBL	475					25	25	25	50
		NBT	475	125	200	50	100	225	275	125	200
		NBR	175	25	25	25	25	25	25	25	25
17	Deer Valley Road & Sand Creek Road	SBL	275	100	200	25	50	175	275	25	75
		SBT	200	150	300	50	100	150	250	75	175
		EBL	625					75	200	25	75
		EBT	625	25	25	25	25	25	25	25	25
		WBL	1375					25	75		
		WBT	1375	25	50	25	50	25	25	25	50
		WBR	1375	25	50	25	25			25	25
		NBL	450			25	25	25	75	25	100
20	Sand Creek Road & State Route 4 (EB Ramps)	NBT	450	150	350	50	225	125	225	25	125
		SBL	525	150	525	25	50	175	475	25	50
		SBT	650	75	275	25	200	100	200	50	125
		EBT	125	25	25			25	25		
		WBR	175	25	25	25	25	25	25	25	25
		SBL	575	50	75	75	125	50	75	75	125
		EBL	425	25	25	25	25	25	25	25	25
		EBT	500	25	50	75	150	25	50	75	150
21	State Route 4 (WB Ramps) & Sand Creek Road	WBT	925	25	50	25	50	25	50	25	50
		WBR	925	25	75	25	75	25	75	25	75
		NBL	650	25	25	25	25	25	25	25	25
		NBT	650	25	25	25	25	25	25	25	25
		NBR	650	25	50	50	125	25	50	50	150
		EBL	550	100	125	50	75	125	175	75	100
		EBT	875	450	475	450	500	450	475	475	525
		WBT	325	200	225	300	350	200	225	350	425
23	Balfour Road & SR-4 EB Ramps	WBR	225	25	25	25	25	25	25	25	25
		SBL	700	200	325	350	550	200	325	350	550
		EBT	125	175	200	225	225	175	175	200	175
		EBR	125	25	25	25	50	25	25	25	25
		WBT	225	400	425	275	225	400	400	275	225
		NBL	575	50	75	50	100	50	75	75	125
		NBR	575	25	25	25	50	25	25	25	50
24	SR-4 WB Ramps & Balfour Road	EBT	125	175	200	225	225	175	175	200	175
		EBR	125	25	25	25	50	25	25	25	25
		WBT	225	400	425	275	225	400	400	275	225
		NBL	575	50	75	50	100	50	75	75	125
		NBR	575	25	25	25	50	25	25	25	50

Int #	Intersection	Movement	Storage Length (ft)	Near Term AM		Near Term PM		Near Term Plus Project AM		Near Term Plus Project PM	
				Average Queue	95th Percentile Queue (ft)	Average Queue	95th Percentile Queue (ft)	Average Queue	95th Percentile Queue (ft)	Average Queue	95th Percentile Queue (ft)
1	Lone Tree Way & State Route 4 (Westbound Ramps)	WBL	325	100	150	50	75	100	150	50	100
		WBR	325	150	250	25	75	150	275	25	100
		NBL	300	300	625	100	225	375	750	125	250
		NBT	300	125	225	50	100	125	225	50	100
		SBT	475	150	200	50	100	150	200	75	100
2	Lone Tree Way & State Route 4 (Eastbound Ramps)	EBL	350	125	150	125	150	125	150	125	150
		EBR	350	600	800	1,075	1,325	675	900	1,325	1,600
		NBT	300	550	575	350	425	650	675	425	500
		SBL	300	175	225	150	250	175	225	150	250
		SBT	300	275	300	250	325	275	300	275	325
3	Hillcrest Avenue & Sunset Drive/Slatten Ranch	EBL	600	25	50	25	75	25	50	25	75
		EBT	600	25	25	25	75	25	25	25	75
		WBL	475	100	200	125	350	100	200	125	350
		WBT	675	75	150	75	225	75	150	75	225
		NBL	225	125	350	75	200	125	350	75	200
		NBT	225	100	175	125	225	100	175	125	225
		NBR	225	25	25	25	50	25	25	25	50
		SBL	225	25	75	25	125	25	75	25	125
		SBT	450	175	300	150	300	175	300	150	300
4	SR 4 EB Ramps & Slatten Ranch	EBT	675	25	50	25	75	25	50	25	75
		EBR	675	25	75	25	75	25	75	25	75
		WBL	550	25	50	25	25	25	50	25	25
		WBT	550	50	100	75	175	50	100	75	175
		NBL	175	25	100	50	150	25	100	50	150
		NBR	175	25	50	25	50	25	50	25	50
5	Hillcrest Avenue & State Route 4 Eastbound Ramps	EBL	725	75	125	100	175	75	125	100	175
		EBT	950	25	25			25	25		
		EBR	725	100	200	375	625	100	225	425	675
		NBT	525	400	475	375	500	425	500	375	500
		SBL	375	75	125	125	200	75	125	125	200
		SBT	200	50	75	100	100	50	75	100	100
6	Lone Tree Way & Davison Drive	EBT	100	50	125	75	200	50	125	100	200
		EBR	100	25	25	25	50	25	25	25	50
		WBL	275	200	350	100	275	200	350	125	275
		WBT	275	50	75	25	75	50	75	25	75
		WBR	100	25	100	25	75	25	100	25	75
		NBL	100	25	75	50	125	25	75	50	150
		NBT	500	575	1,200	275	625	700	1,425	325	725
		SBL	200	100	175	75	175	100	175	75	175
		SBT	275	250	550	325	775	275	575	425	925
7	Deer Valley Road & Davison Drive & Hillcrest Avenue	EBL	200	150	275	150	275	150	275	150	275
		EBT	300	75	100	100	150	75	100	100	150
		WBL	225	75	175	75	150	75	175	75	150
		WBT	475	250	375	200	300	275	375	225	300
		WBR	475	250	450	225	375	275	450	225	375
		NBL	250	75	150	100	200	75	150	100	200
		NBT	575	350	475	375	500	375	500	400	525
		SBL	250	250	375	500	750	250	375	500	750
		SBT	675	400	575	425	575	425	575	425	600
8	Lone Tree Way & James Donlon Boulevard/Ridgerock Drive	EBL	175	125	275	100	225	125	275	125	225
		EBT	575	50	100	50	125	50	100	50	125
		EBR	575	25	75	25	75	25	75	25	75
		WBT	500	75	150	50	75	100	150	50	75
		WBR	500	25	25	25	25	25	25	25	25
		NBL	225	250	525	175	350	275	550	200	375
		NBT	350	375	700	200	450	425	875	225	525
		NBR	125	25	25	25	25	25	25	25	25
		SBL	175	50	125	50	125	50	125	50	125
		SBT	400	225	375	300	625	250	400	350	750
9	Dallas Ranch Road/Eagleridge Drive & Lone Tree Way	EBL	225	75	100	100	175	75	100	100	175
		EBT	350	425	525	575	750	425	525	575	775
		EBR	75	75	150	100	200	125	200	275	425
		WBL	225	200	275	100	175	200	275	125	175
		WBT	350	600	700	325	425	650	800	350	450
		WBR	75	25	25	25	25	25	25	25	25
		NBL	225	175	225	100	150	275	375	150	250
		NBT	425	125	175	50	100	125	175	50	100
		NBR	125	25	50	25	50	25	50	25	50
		SBL	400	75	125	50	100	75	125	50	100
10	Deer Valley Road & Lone Tree Way	SBT	400	275	375	25	75	275	375	25	75
		EBL	225	50	75	75	125	50	75	75	125
		EBT	500	325	400	350	450	325	400	375	475
		EBR	325	25	100	25	75	50	125	25	125
		WBL	525	125	175	100	150	150	200	150	200
		WBT	900	425	475	275	325	425	500	275	325
		WBR	525	25	50	25	75	25	50	25	75
		NBL	200	175	250	100	150	200	300	125	175
11	Hillcrest Avenue & Lone Tree Way	NBT	400	175	225	175	250	200	275	200	300
		SBL	375	175	225	150	250	175	250	175	250
		SBT	375	250	325	100	150	275	350	150	200
		EBL	625	100	375	125	450	100	400	150	475
		EBT	850	125	275	250	525	125	275	250	525
		EBR	275	25	25	25	75	25	25	25	75
		WBL	275	25	125	100	300	50	150	100	325
		WBT	425	150	325	200	375	150	325	200	375
		WBR	425	25	50	25	75	25	50	25	75
		NBL	250	150	475	125	400	150	475	125	400
		NBT	475	25	50	25	75	25	75	25	75
		SBL	625	100	350	175	475	100	350	175	475
		SBT	925	25	50	50	75	25	75	50	75

Int #	Intersection	Movement	Storage Length (ft)	Near Term AM		Near Term PM		Near Term Plus Project AM		Near Term Plus Project PM	
				Average Queue	95th Percentile Queue (ft)	Average Queue	95th Percentile Queue (ft)	Average Queue	95th Percentile Queue (ft)	Average Queue	95th Percentile Queue (ft)
12	SR 4 Eastbound & Lone Tree Way	EBT	675	350	425	650	750	375	425	650	750
		EBR	325	25	100	150	350	25	100	150	350
		WBL	175	150	250	225	375	150	250	225	375
		WBT	700	350	425	525	600	375	450	550	600
		SBL	150	125	200	275	375	150	200	275	375
		SBT	150	150	200	275	375	150	200	275	375
13	SR 4 Westbound & Lone Tree Way	EBT	700	175	325	450	675	175	325	450	700
		EBR	225	25	75	100	275	25	75	125	275
		WBL	300	75	250	125	325	75	250	125	325
		WBT	600	100	200	175	275	100	200	175	275
		WBR	175	25	75	25	100	25	75	25	100
		NBL	200	150	300	300	425	150	300	300	425
		NBT	400	150	300	300	400	150	300	300	400
		NBR	400	50	125	125	225	50	125	125	225
14	Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road	EBL	100	25	75	25	75	25	75	25	75
		EBT	325	50	100	25	75	50	100	25	75
		WBL	225	25	50	25	50	25	50	25	50
		WBT	400	125	275	50	125	150	275	50	125
		NBL	175	25	50	25	50	25	50	25	50
		NBT	750	50	100	25	50	100	150	50	100
		SBL	225	125	325	75	225	150	325	75	225
		SBT	350	25	50	25	50	50	100	50	150
15	Deer Valley Road & Prewett Ranch Drive	EBL	175	100	175	50	100	100	175	50	125
		EBT	450	250	375	75	175	275	375	100	175
		WBL	100	200	350	25	100	225	400	100	275
		WBT	500	200	325	75	150	200	325	75	175
		NBL	175	100	200	75	175	100	225	100	200
		NBT	550	225	300	150	300	350	500	225	400
		SBL	175	125	250	150	450	125	250	175	475
		SBT	350	375	500	100	250	400	575	175	350
16	Deer Valley Road & Wellness Way	EBL	25					125	250	75	200
		EBT	25					25	25	25	25
		WBL	250	25	50	25	50	25	50	25	100
		WBT	25							50	150
		WBR	250	25	50	25	50	25	25		
		NBL	475					25	25	25	25
		NBT	475	125	250	75	125	250	300	150	225
		NBR	175	25	25	25	25	25	25	25	25
		SBL	275	125	225	25	75	200	300	50	100
		SBT	200	75	100	25	50	175	275	100	225
17	Deer Valley Road & Sand Creek Road	EBL	625					50	150	50	75
		EBR	625					25	25	25	25
		WBL	1375	50	75	25	75	75	200		
		WBT	1375	25	25	25	25	25	25	25	75
		WBR	1375							25	50
		NBL	450					25	75	25	100
		NBT	450	100	175	50	125	125	225	50	150
		SBL	525	150	475	25	100	225	575	25	100
18	Sand Creek Road & Hillcrest Avenue	SBT	650	50	125	25	75	100	225	50	150
		EBL	1450			25	25			25	25
		EBT	1450	25	25	25	50	25	25	25	50
		WBT	1225	25	50	25	50	25	50	25	50
19	Sand Creek Road & Heidorn Ranch Road	SBL	525	25	50	25	50	50	75	25	75
		EBL	275			25	25			25	25
		EBT	275	75	100	75	100	75	125	75	100
		WBT	450	25	50	50	125	25	75	75	150
20	Sand Creek Road & State Route 4 (EB Ramps)	SBL	375	25	50	25	75	50	75	25	75
		EBL	125	50	125	75	225	75	175	100	225
		EBT	125	75	175	100	225	100	225	100	275
		WBT	175	50	100	125	325	50	100	150	400
		WBR	175	25	50	25	50	25	50	25	75
21	State Route 4 (WB Ramps) & Sand Creek Road	SBL	575	100	200	150	225	125	250	150	225
		EBL	425	50	100	50	100	50	100	75	100
		EBT	500	50	100	175	275	50	100	175	300
		WBT	925	50	100	75	125	50	100	75	125
		WBR	925	50	675	100	700	75	675	100	725
		NBL	650	50	75	200	300	50	75	225	325
		NBT	650	50	75	25	25	50	75	25	25
		NBR	650	50	125	125	225	50	125	150	225

Int #	Intersection	Movement	Storage Length (ft)	Cumulative AM		Cumulative PM		Cumulative Plus Project AM		Cumulative Plus Project PM	
				Average Queue (ft)	95th Percentile Queue (ft)	Average Queue (ft)	95th Percentile Queue (ft)	Average Queue (ft)	95th Percentile Queue (ft)	Average Queue (ft)	95th Percentile Queue (ft)
1	Lone Tree Way & State Route 4 (Westbound Ramps)	WBL	325	150	200	100	150	150	200	100	150
		WBT	875	25	25	25	25	25	25	25	25
		WBR	325	300	525	175	300	300	525	175	300
		NBL	300	475	700	400	575	600	850	475	675
		NBT	300	250	300	325	375	250	300	350	400
2	Lone Tree Way & State Route 4 (Eastbound Ramps)	SBT	475	200	225	200	225	200	250	200	250
		EBL	350	150	200	125	150	150	200	125	150
		EBT	850	25	25	25	25	25	25	25	25
		EBR	350	950	1,200	1,200	1,475	1,025	1,300	1,425	1,725
		NBT	300	525	600	775	850	625	700	825	900
3	Hillcrest Avenue & Sunset Drive/Slatten Ranch	SBL	300	175	225	175	250	175	250	175	250
		SBT	300	325	400	350	425	350	400	350	450
		EBL	600	25	75	50	100	25	75	50	100
		EBT	600	25	75	25	100	25	75	25	100
		WBL	475	125	250	300	575	125	250	300	575
4	SR 4 EB Ramps & Slatten Ranch	WBT	675	125	225	200	350	125	225	200	350
		NBL	225	225	525	425	850	225	550	425	850
		NBT	225	125	250	175	300	125	250	175	300
		NBR	225	25	50	25	50	25	50	25	50
		SBL	225	50	150	75	200	50	150	75	200
5	Hillcrest Avenue & State Route 4 Eastbound Ramps	SBT	450	250	425	275	425	250	400	275	425
		EBT	675	100	150	75	125	100	150	75	125
		EBR	675	225	625	25	75	250	625	25	100
		WBL	550	100	125	50	125	100	125	50	125
		WBT	550	75	150	175	300	75	150	175	300
6	Lone Tree Way & Davison Drive	NBL	175	150	200	100	250	150	200	100	250
		NBR	175	25	75	25	50	25	100	25	50
		EBL	725	100	150	200	250	100	150	200	250
		EBT	950	25	25	25	25	25	25	25	25
		EBR	725	275	400	1,475	1,575	275	400	1,525	1,625
7	Deer Valley Road & Davison Drive & Hillcrest Avenue	NBT	525	800	975	1,300	1,400	800	975	1,325	1,400
		SBL	375	100	125	350	475	100	125	350	475
		SBT	200	75	75	225	250	75	75	225	250
		EBT	100	75	150	125	225	75	150	125	225
		EBR	100	25	25	25	75	25	25	25	75
8	Lone Tree Way & James Donlon Boulevard/Ridgerock Drive	WBL	275	225	375	150	300	225	375	175	300
		WBT	275	50	100	50	100	50	100	50	100
		WBR	100	25	100	25	75	25	100	25	75
		NBL	100	50	100	75	175	50	100	100	175
		NBT	500	1,075	1,825	425	775	1,250	2,050	500	875
9	Dallas Ranch Road/Eagleridge Drive & Lone Tree Way	SBL	200	100	175	100	225	100	175	125	225
		SBT	275	275	575	450	875	300	600	550	1,100
		EBL	200	200	300	200	300	200	325	200	300
		EBT	300	75	125	125	175	75	125	125	175
		WBL	225	125	250	100	200	125	250	100	200
10	Deer Valley Road & Lone Tree Way	WBT	475	400	500	300	375	400	500	300	375
		WBR	475	425	600	350	475	425	600	350	475
		NBL	250	125	250	200	350	125	275	200	350
		NBT	575	700	975	475	625	700	975	500	675
		SBL	250	325	450	850	1,050	325	475	850	1,050
11	Hillcrest Avenue & Lone Tree Way	SBT	675	550	650	650	850	550	650	700	950
		EBL	175	175	375	125	250	175	375	125	250
		EBT	575	50	125	75	150	50	125	75	150
		EBR	575	25	75	25	75	25	75	25	75
		WBL	500	150	200	50	100	150	200	50	100
12	Dallas Ranch Road/Eagleridge Drive & Lone Tree Way	WBR	500	25	50	25	25	25	50	25	25
		NBL	225	350	625	225	475	375	650	250	500
		NBT	350	475	875	250	500	575	1,025	275	575
		NBR	125	25	25	25	25	25	25	25	25
		SBL	175	75	150	75	175	75	175	75	175
13	Dallas Ranch Road/Eagleridge Drive & Lone Tree Way	SBT	400	300	475	325	600	325	525	375	725
		EBL	225	50	100	125	175	50	100	125	175
		EBT	350	525	725	600	825	525	725	625	825
		EBR	75	50	125	125	200	100	200	275	425
		WBL	225	200	300	125	175	200	300	125	200
14	Deer Valley Road & Lone Tree Way	WBT	350	625	825	425	550	675	875	450	575
		WBR	75	25	25	25	25	25	25	25	25
		NBL	225	175	225	100	150	250	375	175	275
		NBT	425	125	175	50	100	125	175	50	100
		NBR	125	25	75	25	50	25	75	25	50
15	Deer Valley Road & Lone Tree Way	SBL	400	75	125	50	100	75	125	50	100
		SBT	400	250	375	50	100	250	375	50	125
		EBL	225	50	100	100	200	50	100	100	200
		EBT	500	350	450	375	525	350	450	400	525
		EBR	325	25	100	75	175	25	125	125	275
16	Hillcrest Avenue & Lone Tree Way	WBL	525	150	200	125	175	150	225	150	200
		WBT	900	425	500	375	475	425	500	375	475
		WBR	525	25	75	25	75	25	75	25	75
		NBL	200	200	325	150	275	225	400	175	325
		NBT	400	200	300	275	375	250	325	325	425
17	Hillcrest Avenue & Lone Tree Way	SBL	375	175	275	175	325	200	300	200	325
		SBT	375	250	350	150	200	275	375	175	250
		EBL	625	325	625	425	675	350	650	450	725
		EBT	850	325	475	750	1,000	325	475	750	1,000
		EBR	275	25	50	50	125	25	50	50	125
18	Hillcrest Avenue & Lone Tree Way	WBL	275	100	200	275	500	100	225	300	525
		WBT	425	300	400	350	450	275	400	350	450
		WBR	425	25	125	50	125	25	125	50	125
		NBL	250	300	600	350	600	300	600	350	600
		NBT	475	250	350	300	375	250	350	300	375

Int #	Intersection	Movement	Storage Length (ft)	Cumulative AM		Cumulative PM		Cumulative Plus Project AM		Cumulative Plus Project PM	
				Average Queue	95th Percentile Queue (ft)	Average Queue	95th Percentile Queue (ft)	Average Queue	95th Percentile Queue (ft)	Average Queue	95th Percentile Queue (ft)
12	SR 4 Eastbound & Lone Tree Way	SBL	625	250	450	350	500	250	450	350	500
		SBT	925	75	125	150	200	75	125	150	200
		EBT	1025	800	875	1,100	1,175	800	900	1,100	1,175
		EBR	325	375	700	1,150	1,425	375	700	1,150	1,425
		WBL	175	350	525	525	725	350	525	525	725
		WBT	700	425	475	350	375	425	475	350	375
		SBL	150	300	425	575	800	300	425	575	800
13	SR 4 Westbound & Lone Tree Way	SBT	150	300	425	550	775	300	425	550	775
		EBT	700	650	750	1,100	1,225	650	750	1,125	1,225
		EBR	225	250	475	350	625	250	450	350	625
		WBL	300	175	325	225	400	175	325	225	400
		WBT	600	200	250	250	300	200	225	250	300
		WBR	175	25	75	50	175	25	75	50	175
		NBL	200	300	425	400	575	300	425	400	575
14	Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road	NBT	400	300	425	400	575	300	425	400	575
		NBR	400	950	1,200	150	250	925	1,200	150	250
		EBL	100	50	125	50	175	50	125	50	175
		EBT	325	75	175	75	150	100	175	75	150
		WBL	225	25	50	25	50	25	50	25	50
		WBT	400	150	325	50	150	175	350	50	150
		NBL	175	25	50	25	50	25	50	25	50
15	Deer Valley Road & Prewett Ranch Drive	NBT	750	50	100	25	50	100	175	50	100
		SBL	225	225	625	175	675	275	625	200	675
		SBT	350	100	150	100	225	100	175	150	325
		EBL	175	125	200	75	175	125	225	75	175
		EBT	450	325	500	125	225	325	525	125	225
		WBL	100	250	450	50	100	150	250	25	75
		WBT	500	250	375	100	200	250	375	125	225
16	Deer Valley Road & Wellness Way	NBL	175	150	275	100	225	150	300	125	250
		NBT	550	375	500	175	325	450	625	250	400
		SBL	175	150	275	175	500	125	275	200	525
		SBT	350	700	850	150	275	700	875	200	350
		EBL	25					25	75	25	50
		EBT	25					25	25	25	25
		WBL	250	25	50	50	125	25	50	50	150
17	Deer Valley Road & Sand Creek Road	WBR	250	25	50	25	75	25	50	25	75
		NBL	475					25	25	25	25
		NBT	475	175	275	100	175	200	300	125	225
		NBR	175	25	25	25	25	25	25	25	25
		SBL	275	150	325	50	100	175	350	50	100
		SBT	200	75	125	50	75	75	125	75	125
		EBL	625					75	150	50	150
18	Hillcrest Avenue & Sand Creek Road	EBT	625					100	200	50	125
		EBR	625					25	25	25	25
		WBL	1375	50	100	50	125	75	175	50	125
		WBT	1375	25	75	25	75	125	250	75	175
		NBL	450					25	50	25	75
		NBT	450	100	250	100	275	175	325	125	275
		SBL	525	100	250	75	175	175	325	75	175
19	Sand Creek Road & Heidorn Ranch Road	SBT	650	50	200	25	100	150	325	75	150
		EBL	275	50	100	50	100	50	125	75	125
		EBT	275	100	150	125	150	125	175	125	175
		WBT	450	200	275	200	275	225	275	275	350
		WBR	450	25	75	25	125	25	100	50	125
		SBL	375	75	125	75	175	100	125	100	175
		EBL	950	300	500	650	925	400	600	800	1,050
20	Sand Creek Road & State Route 4 (EB Ramps)	EBT	950	125	125	200	225	125	150	200	250
		WBT	175	900	1,025	425	500	925	1,050	525	600
		WBR	175	125	225	50	125	125	225	75	150
		SBL	575	550	675	1,050	1,275	525	650	1,150	1,275
21	State Route 4 (WB Ramps) &	EBL	425	225	375	500	625	275	425	500	650

# **Appendix E: Near-term Projects Trip Generation**

**The Ranch**  
**Approved and Pending Projects Trip Generation**

**1. AR-14-07 Park Ridge**

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	525	5000	98	296	394	331	194	525

**2. PDP-13-01 Heidorn Village**

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	117	1110	22	66	88	74	43	117

**3. R-16-02 Aviano**

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	533	5070	100	300	400	336	197	533

**4. GP-14-01 Vineyards at Sand Creek**

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	641	6100	120	361	481	404	237	641

**5. PDP-15-03 Laurel Ranch**

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	187	1780	35	105	140	118	69	187

**6. Wildflower (Vistro Zone 55)**

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	22	210	4	13	17	14	8	22
Apartment	220	98	650	10	40	50	40	21	61
Retail	820	89.4	3820	53	33	86	159	173	332
Less Pass-by		-25%	-960	-11	-11	-22	-42	-41	-83
Net-New Retail			2860	42	22	64	117	132	249
			3510	56	75	131	171	161	332

**7. TSM 8982 (Alexandra Homes) Parkside Villas**

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	37	350	7	21	28	23	14	37

**8. TSM 8506 (Discovery Builders) Bridle Gate**

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	265	2520	50	149	199	167	98	265
Elementary School		700	900	173	142	315	51	54	105
Apartment (Enclave)	220	258	1720	26	106	132	104	56	160
Retail	820	150	6410	89	55	144	267	290	557
Less Pass-by		-25%	-1600	-18	-18	-36	-70	-70	-140
Net-New Retail			4810	71	37	108	197	220	417

**9. TSM 9360 (Brentwood CC Partners) Brentwood Country Club**

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU Active Adult	251	63	230	5	9	14	10	7	17
Residential Care Facility	255	123	310	12	6	18	10	15	25



**The Ranch**  
**Approved and Pending Projects Trip Generation**

Total	540	17	15	32	20	22	42
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**10. TSM 9428 (Richland Communities) Orfanos (Vistro Zone 45 shared with Project 11)**

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	160	1520	30	90	120	101	59	160

**11. TSM 9412 (Alvernaz Partners)**

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	48	460	9	27	36	30	18	48

**12. Streets of Brentwood**

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Apartment	220	320	2130	33	130	163	129	69	198
Retail	820	32	1370	19	12	31	57	62	119
Less Pass-by		-25%	-340	-4	-4	-8	-15	-15	-30
Net-New Retail			1030	15	8	23	42	47	89
			3160	48	138	186	171	116	287

**13. Chick-Fil-A**

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Grocery Store	850	31	3,170	65	40	105	150	144	294
High Turnover Resturaunt	932	5.74	730	6	1	7	34	23	57
Drive Thru	934	12.75	6,330	295	284	579	216	200	416
Automated Car Wash	948	4.33	520	22	22	44	31	31	61
			10,750	389	347	736	431	397	828
Pass by trips			(4,460)	(169)	(156)	(326)	(170)	(155)	(325)
Total Estimated Trip Gen			6,290	220	191	410	261	242	503

**14. Quail Cove**



















Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Single Family - Detached DU	210	32	300	6	18	24	20	12	32

# **Appendix F: Phasing Analysis LOS Result Summary**

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Existing Plus Phase 1 AM Peak Hour








												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	232	0	283	848	751	0	0	651	419
Future Volume (veh/h)	0	0	0	232	0	283	848	751	0	0	651	419
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				273	0	174	998	884	0	0	766	140
Peak Hour Factor				0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %				1	0	1	2	2	0	0	2	2
Cap, veh/h				623	0	286	1189	2364	0	0	1565	382
Arrive On Green				0.18	0.00	0.18	0.34	0.67	0.00	0.00	0.24	0.24
Sat Flow, veh/h				3483	0	1598	3456	3647	0	0	6696	1572
Grp Volume(v), veh/h				273	0	174	998	884	0	0	766	140
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1728	1777	0	0	1609	1572
Q Serve(g_s), s				3.6	0.0	5.2	13.7	5.7	0.0	0.0	5.3	3.8
Cycle Q Clear(g_c), s				3.6	0.0	5.2	13.7	5.7	0.0	0.0	5.3	3.8
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				623	0	286	1189	2364	0	0	1565	382
V/C Ratio(X)				0.44	0.00	0.61	0.84	0.37	0.00	0.00	0.49	0.37
Avail Cap(c_a), veh/h				2916	0	1337	3027	6157	0	0	5010	1224
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				18.8	0.0	19.4	15.5	3.8	0.0	0.0	16.7	16.1
Incr Delay (d2), s/veh				0.2	0.0	0.8	0.6	0.0	0.0	0.0	0.1	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.2	0.0	1.6	4.2	0.7	0.0	0.0	1.6	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				19.0	0.0	20.2	16.2	3.9	0.0	0.0	16.8	16.4
LnGrp LOS				B	A	C	B	A	A	A	B	B
Approach Vol, veh/h					447			1882			906	
Approach Delay, s/veh					19.5			10.4			16.7	
Approach LOS					B			B			B	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	38.2			21.7			16.5			13.2		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	7.7			15.7			7.3			7.2		
Green Ext Time (p_c), s	4.0			2.0			3.6			0.7		
Intersection Summary												
HCM 6th Ctrl Delay	13.4											
HCM 6th LOS	B											

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	349	0	515	0	0	0	0	1251	190	276	606	0
Future Volume (veh/h)	349	0	515	0	0	0	0	1251	190	276	606	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1885	1885	1870	1870	0
Adj Flow Rate, veh/h	406	0	599				0	1455	200	321	705	0
Peak Hour Factor	0.86	0.86	0.86				0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3				0	1	1	2	2	0
Cap, veh/h	992	0	883				0	2281	313	444	2011	0
Arrive On Green	0.28	0.00	0.28				0.00	0.39	0.37	0.13	0.57	0.00
Sat Flow, veh/h	3534	0	3145				0	6071	797	3456	3647	0
Grp Volume(v), veh/h	406	0	599				0	1218	437	321	705	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1621	1740	1728	1777	0
Q Serve(g_s), s	5.7	0.0	10.3				0.0	12.3	12.4	5.4	6.5	0.0
Cycle Q Clear(g_c), s	5.7	0.0	10.3				0.0	12.3	12.4	5.4	6.5	0.0
Prop In Lane	1.00		1.00				0.00		0.46	1.00		0.00
Lane Grp Cap(c), veh/h	992	0	883				0	1910	683	444	2011	0
V/C Ratio(X)	0.41	0.00	0.68				0.00	0.64	0.64	0.72	0.35	0.00
Avail Cap(c_a), veh/h	4023	0	3580				0	3370	1206	969	3694	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.7	0.0	19.4				0.0	14.9	15.2	25.4	7.1	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.9				0.0	0.1	0.4	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	3.3				0.0	3.6	4.0	2.0	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.0	0.0	20.3				0.0	15.0	15.6	26.2	7.2	0.0
LnGrp LOS	B	A	C				A	B	B	C	A	A
Approach Vol, veh/h	1005						1655			1026		
Approach Delay, s/veh	19.4						15.2			13.1		
Approach LOS	B						B			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	1.8	27.8	21.0		39.6							
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	7.0	40.7	68.5		* 63							
Max Q Clear Time (g_c+I1), s	7.4	14.4	12.3		8.5							
Green Ext Time (p_c), s	0.4	8.1	4.3		3.0							

### Intersection Summary

HCM 6th Ctrl Delay	15.7
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.















\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Existing Plus Phase 1 AM Peak Hour

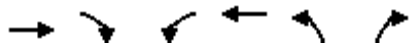


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	 		 	
Traffic Volume (veh/h)	23	2	81	424	79	104	231	462	900	26	593	31
Future Volume (veh/h)	23	2	81	424	79	104	231	462	900	26	593	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1841	1841	1841	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	27	2	0	499	93	66	272	544	373	31	698	31
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	8	8	4	4	4	2	2	2	5	5	5
Cap, veh/h	42	172	0	701	214	152	328	1424	1100	126	977	43
Arrive On Green	0.02	0.10	0.00	0.14	0.21	0.20	0.18	0.40	0.40	0.07	0.29	0.27
Sat Flow, veh/h	1697	1781	0	4944	1002	711	1781	3554	2745	1739	3383	150
Grp Volume(v), veh/h	27	2	0	499	0	159	272	544	373	31	358	371
Grp Sat Flow(s),veh/h/ln	1697	1781	0	1648	0	1713	1781	1777	1372	1739	1735	1799
Q Serve(g_s), s	0.9	0.1	0.0	5.3	0.0	4.5	8.1	6.0	5.2	0.9	10.2	10.3
Cycle Q Clear(g_c), s	0.9	0.1	0.0	5.3	0.0	4.5	8.1	6.0	5.2	0.9	10.2	10.3
Prop In Lane	1.00		0.00	1.00		0.42	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	42	172	0	701	0	366	328	1424	1100	126	501	519
V/C Ratio(X)	0.65	0.01	0.00	0.71	0.00	0.43	0.83	0.38	0.34	0.25	0.71	0.72
Avail Cap(c_a), veh/h	153	955	0	1071	0	1134	546	3097	2393	126	1105	1146
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.8	22.6	0.0	22.7	0.0	19.0	21.8	11.7	11.5	24.3	17.7	17.7
Incr Delay (d2), s/veh	6.2	0.0	0.0	0.5	0.0	0.3	2.1	0.1	0.1	0.4	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.8	0.0	1.5	3.1	1.8	1.2	0.4	3.4	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.9	22.7	0.0	23.2	0.0	19.3	23.8	11.8	11.6	24.7	18.4	18.4
LnGrp LOS	C	C	A	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	29		658			1189			760			
Approach Delay, s/veh	32.2		22.3			14.5			18.6			
Approach LOS	C		C			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	26.2	11.9	9.3	14.2	20.0	5.4	15.8				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	47.4	12.0	29.1	17.0	34.4	5.0	36.1				
Max Q Clear Time (g_c+I2,s)	4.0	8.0	7.3	2.1	10.1	12.3	2.9	6.5				
Green Ext Time (p_c), s	0.0	3.1	0.5	0.0	0.2	2.5	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay			17.8									
HCM 6th LOS			B									

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Existing Plus Phase 1 AM Peak Hour







Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	234	694	55	283	324	160
Future Volume (veh/h)	234	694	55	283	324	160
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1366	1366	1856	1856
Adj Flow Rate, veh/h	252	228	59	304	348	34
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	36	36	3	3
Cap, veh/h	1034	456	214	716	616	282
Arrive On Green	0.29	0.29	0.08	0.52	0.18	0.18
Sat Flow, veh/h	3647	1566	2525	1366	3428	1572
Grp Volume(v), veh/h	252	228	59	304	348	34
Grp Sat Flow(s), veh/h/ln	1777	1566	1262	1366	1714	1572
Q Serve(g_s), s	1.5	3.3	0.6	3.7	2.5	0.5
Cycle Q Clear(g_c), s	1.5	3.3	0.6	3.7	2.5	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1034	456	214	716	616	282
V/C Ratio(X)	0.24	0.50	0.28	0.42	0.57	0.12
Avail Cap(c_a), veh/h	7113	3134	524	3221	2338	1072
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.3	7.9	11.6	3.9	10.1	9.3
Incr Delay (d2), s/veh	0.0	0.3	0.7	0.1	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	0.1	0.0	0.7	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.3	8.3	12.3	4.1	10.4	9.4
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	480			363	382	
Approach Delay, s/veh	7.8			5.4	10.3	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		8.8	6.3	11.8		18.1
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		18.4	5.1	53.4		63.0
Max Q Clear Time (g_c+I1), s		4.5	2.6	5.3		5.7
Green Ext Time (p_c), s		0.6	0.0	1.3		1.1
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			7.9			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	0	816	0	0	0	0	1420	356	158	668	0
Future Volume (veh/h)	173	0	816	0	0	0	0	1420	356	158	668	0
Initial Q (Qb), veh	0	0	60				0	60	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00					1.00	0.97		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No				No	
Adj Sat Flow, veh/h/ln	1870	0	1870				0	1870	1870	1826	1826	0
Adj Flow Rate, veh/h	197	0	276				0	1614	370	180	759	0
Peak Hour Factor	0.88	0.88	0.88				0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	0	2				0	2	2	5	5	0
Cap, veh/h	521	0	582				0	2462	477	269	3658	0
Arrive On Green	0.14	0.00	0.14				0.00	0.55	0.54	0.08	0.72	0.00
Sat Flow, veh/h	3456	0	3614				0	4844	939	3374	5149	0
Grp Volume(v), veh/h	197	0	276				0	1327	657	180	759	0
Grp Sat Flow(s),veh/h/ln	1728	0	1205				0	1122	1668	1687	1662	0
Q Serve(g_s), s	3.0	0.0	4.1				0.0	16.9	17.1	3.0	2.9	0.0
Cycle Q Clear(g_c), s	3.0	0.0	4.1				0.0	16.9	17.1	3.0	2.9	0.0
Prop In Lane	1.00	1.00					0.00	0.56		1.00	0.00	
Lane Grp Cap(c), veh/h	521	0	582				0	1927	953	269	3658	0
V/C Ratio(X)	0.38	0.00	0.47				0.00	0.69	0.69	0.67	0.21	0.00
Avail Cap(c_a), veh/h	1065	0	1114				0	3921	1943	693	4013	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.5	0.0	38.4				0.0	11.7	10.9	33.8	3.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.2				0.0	0.2	0.3	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	145.5				0.0	12.6	5.8	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	11.8				0.0	7.5	8.0	1.5	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.7	0.0	184.1				0.0	24.5	17.0	34.9	3.1	0.0
LnGrp LOS	C	A	F				A	C	B	C	A	A
Approach Vol, veh/h	473						1984				939	
Approach Delay, s/veh	119.4						22.0				9.2	
Approach LOS	F						C				A	
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	9.8	36.3	12.2		46.1							
Change Period (Y+Rc), s	4.9	* 4.9	5.3		4.9							
Max Green Setting (Gmax), s	2.0	* 67	16.7		46.1							
Max Q Clear Time (g_c+I15), s	19.1	19.1	6.1		4.9							
Green Ext Time (p_c), s	0.2	12.4	0.8		3.4							

### Intersection Summary

HCM 6th Ctrl Delay	32.0
HCM 6th LOS	C

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	↰
Traffic Volume (veh/h)	27	22	20	182	32	233	21	1097	111	159	769	20
Future Volume (veh/h)	27	22	20	182	32	233	21	1097	111	159	769	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	25	0	207	36	14	24	1247	123	181	874	22
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	1	1	1	2	2	2	2	2	2
Cap, veh/h	62	50	98	281	295	249	38	1518	149	279	1855	47
Arrive On Green	0.06	0.06	0.00	0.16	0.16	0.16	0.02	0.46	0.46	0.08	0.52	0.52
Sat Flow, veh/h	1000	806	1572	1795	1885	1595	1781	3267	321	3456	3540	89
Grp Volume(v), veh/h	56	0	0	207	36	14	24	677	693	181	439	457
Grp Sat Flow(s),veh/h/ln	1806	0	1572	1795	1885	1595	1781	1777	1811	1728	1777	1852
Q Serve(g_s), s	2.0	0.0	0.0	7.5	1.1	0.5	0.9	22.3	22.6	3.4	10.6	10.6
Cycle Q Clear(g_c), s	2.0	0.0	0.0	7.5	1.1	0.5	0.9	22.3	22.6	3.4	10.6	10.6
Prop In Lane	0.55		1.00	1.00		1.00	1.00		0.18	1.00		0.05
Lane Grp Cap(c), veh/h	113	0	98	281	295	249	38	825	841	279	931	970
V/C Ratio(X)	0.50	0.00	0.00	0.74	0.12	0.06	0.63	0.82	0.82	0.65	0.47	0.47
Avail Cap(c_a), veh/h	931	0	811	1005	1056	893	420	1964	2002	815	1964	2047
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	0.0	0.0	27.3	24.6	24.4	32.9	15.7	15.8	30.2	10.2	10.2
Incr Delay (d2), s/veh	1.3	0.0	0.0	1.4	0.1	0.0	6.2	0.8	0.8	0.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	3.0	0.5	0.2	0.4	7.3	7.6	1.4	3.6	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.0	0.0	0.0	28.7	24.7	24.4	39.1	16.5	16.6	31.2	10.3	10.4
LnGrp LOS	C	A	A	C	C	C	D	B	B	C	B	B
Approach Vol, veh/h	56			257			1394			1077		
Approach Delay, s/veh	32.0			27.9			16.9			13.9		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	35.5		8.2	5.5	39.6		14.6				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+1), s	15.4	24.6		4.0	2.9	12.6		9.5				
Green Ext Time (p_c), s	0.2	6.4		0.1	0.0	4.1		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	17.1											
HCM 6th LOS	B											













# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	117	70	39	127	621	64	659	13	448	843	125
Future Volume (veh/h)	142	117	70	39	127	621	64	659	13	448	843	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	160	131	18	44	143	698	72	740	14	503	947	70
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	2	2	2
Cap, veh/h	199	985	133	57	440	1291	144	969	18	615	1247	706
Arrive On Green	0.11	0.31	0.31	0.03	0.23	0.23	0.08	0.27	0.25	0.18	0.35	0.33
Sat Flow, veh/h	1781	3139	423	1795	1885	3195	1795	3595	68	3456	3554	1582
Grp Volume(v), veh/h	160	73	76	44	143	698	72	369	385	503	947	70
Grp Sat Flow(s),veh/h/ln	1781	1777	1785	1795	1885	1598	1795	1791	1872	1728	1777	1582
Q Serve(g_s), s	6.8	2.3	2.4	1.9	4.9	12.9	3.0	14.6	14.7	10.8	18.2	1.0
Cycle Q Clear(g_c), s	6.8	2.3	2.4	1.9	4.9	12.9	3.0	14.6	14.7	10.8	18.2	1.0
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	199	558	560	57	440	1291	144	483	505	615	1247	706
V/C Ratio(X)	0.80	0.13	0.14	0.78	0.32	0.54	0.50	0.76	0.76	0.82	0.76	0.10
Avail Cap(c_a), veh/h	529	1699	1707	232	1486	3063	255	1111	1161	1429	3168	1561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.5	19.0	19.1	37.2	24.6	17.6	34.1	26.0	26.0	30.6	22.2	4.2
Incr Delay (d2), s/veh	2.9	0.0	0.0	8.1	0.2	0.1	1.0	1.0	0.9	1.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.9	0.9	0.9	2.0	4.2	1.3	5.8	6.0	4.4	7.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.4	19.0	19.1	45.3	24.8	17.7	35.1	26.9	26.9	31.6	22.6	4.2
LnGrp LOS	D	B	B	D	C	B	D	C	C	C	C	A
Approach Vol, veh/h	309			885			826			1520		
Approach Delay, s/veh	28.0			20.2			27.6			24.7		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.8	24.9	6.4	28.3	11.5	31.2	12.7	22.1				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	32.0	46.7	10.0	73.4	11.0	* 68	23.0	60.4				
Max Q Clear Time (g_c+I1), s	12.8	16.7	3.9	4.4	5.0	20.2	8.8	14.9				
Green Ext Time (p_c), s	0.9	2.6	0.0	0.5	0.0	5.4	0.2	2.1				

### Intersection Summary

HCM 6th Ctrl Delay 24.6

HCM 6th LOS C

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	59	575	7	95	55	744	1085	13	66	709	145
Future Volume (veh/h)	159	59	575	7	95	55	744	1085	13	66	709	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	110	131	76	7	96	8	752	1096	6	67	716	126
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	2	2	2
Cap, veh/h	215	226	383	11	151	135	899	1754	765	85	1170	204
Arrive On Green	0.12	0.12	0.12	0.09	0.09	0.09	0.26	0.49	0.49	0.05	0.27	0.26
Sat Flow, veh/h	1795	1885	3195	127	1737	1551	3483	3582	1561	1781	4361	758
Grp Volume(v), veh/h	110	131	76	103	0	8	752	1096	6	67	557	285
Grp Sat Flow(s),veh/h/ln	1795	1885	1598	1864	0	1551	1742	1791	1561	1781	1702	1715
Q Serve(g_s), s	3.6	4.1	1.3	3.3	0.0	0.3	12.8	14.1	0.1	2.3	9.0	9.1
Cycle Q Clear(g_c), s	3.6	4.1	1.3	3.3	0.0	0.3	12.8	14.1	0.1	2.3	9.0	9.1
Prop In Lane	1.00		1.00	0.07		1.00	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	215	226	383	162	0	135	899	1754	765	85	913	460
V/C Ratio(X)	0.51	0.58	0.20	0.64	0.00	0.06	0.84	0.62	0.01	0.78	0.61	0.62
Avail Cap(c_a), veh/h	516	542	919	1161	0	967	1836	3205	1397	313	1849	932
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	26.0	24.8	27.6	0.0	26.2	22.0	11.7	8.2	29.5	20.0	20.2
Incr Delay (d2), s/veh	0.7	0.9	0.1	1.6	0.0	0.1	0.8	0.1	0.0	5.8	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.7	0.5	1.4	0.0	0.1	4.6	4.2	0.0	1.1	3.3	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.5	26.9	24.9	29.2	0.0	26.3	22.8	11.9	8.2	35.3	20.3	20.7
LnGrp LOS	C	C	C	C	A	C	C	B	A	D	C	C
Approach Vol, veh/h	317			111			1854			909		
Approach Delay, s/veh	26.3			29.0			16.3			21.5		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	34.7		11.5	20.2	21.5		9.4				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	1.0	54.7		17.1	33.0	* 33		39.0				
Max Q Clear Time (g_c+14), s	14.3	16.1		6.1	14.8	11.1		5.3				
Green Ext Time (p_c), s	0.0	5.3		0.5	1.4	3.9		0.3				

### Intersection Summary

HCM 6th Ctrl Delay	19.2
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.













\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	732	192	185	969	69	322	139	173	62	173	111
Future Volume (veh/h)	46	732	192	185	969	69	322	139	173	62	173	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	53	841	105	213	1114	24	370	160	50	71	199	108
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	68	1022	448	250	1384	603	452	664	549	92	312	169
Arrive On Green	0.04	0.29	0.29	0.14	0.39	0.39	0.13	0.35	0.35	0.05	0.27	0.26
Sat Flow, veh/h	1795	3582	1571	1795	3582	1561	3483	1885	1559	1810	1141	619
Grp Volume(v), veh/h	53	841	105	213	1114	24	370	160	50	71	0	307
Grp Sat Flow(s),veh/h/ln	1795	1791	1571	1795	1791	1561	1742	1885	1559	1810	0	1760
Q Serve(g_s), s	2.7	20.3	4.7	10.7	25.7	0.9	9.6	5.6	2.0	3.6	0.0	14.3
Cycle Q Clear(g_c), s	2.7	20.3	4.7	10.7	25.7	0.9	9.6	5.6	2.0	3.6	0.0	14.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	68	1022	448	250	1384	603	452	664	549	92	0	481
V/C Ratio(X)	0.78	0.82	0.23	0.85	0.80	0.04	0.82	0.24	0.09	0.77	0.00	0.64
Avail Cap(c_a), veh/h	174	1600	702	465	2180	950	714	968	801	215	0	752
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.2	30.9	25.4	39.0	25.3	17.7	39.3	21.3	20.1	43.5	0.0	29.9
Incr Delay (d2), s/veh	6.9	1.0	0.1	3.2	0.5	0.0	2.0	0.1	0.0	5.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	8.3	1.7	4.7	10.0	0.3	4.0	2.3	0.7	1.7	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.1	32.0	25.5	42.2	25.9	17.7	41.3	21.3	20.1	48.5	0.0	30.4
LnGrp LOS	D	C	C	D	C	B	D	C	C	D	A	C
Approach Vol, veh/h	999			1351			580			378		
Approach Delay, s/veh	32.3			28.3			33.9			33.8		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	36.6	16.9	30.4	16.0	29.3	7.5	39.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	1.0	46.3	24.0	* 41	19.0	38.3	9.0	* 56				
Max Q Clear Time (g_c+15.6)	1.0	7.6	12.7	22.3	11.6	16.3	4.7	27.7				
Green Ext Time (p_c), s	0.0	0.6	0.2	3.6	0.4	1.0	0.0	5.3				

### Intersection Summary

HCM 6th Ctrl Delay	31.1
HCM 6th LOS	C

### Notes











\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	615	272	233	644	215	391	300	139	297	531	20
Future Volume (veh/h)	27	615	272	233	644	215	391	300	139	297	531	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	31	715	63	271	749	86	455	349	71	345	617	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	40	1009	426	302	1524	671	520	836	168	414	891	30
Arrive On Green	0.02	0.28	0.28	0.17	0.43	0.43	0.15	0.28	0.27	0.12	0.25	0.24
Sat Flow, veh/h	1795	3582	1514	1781	3554	1563	3483	2958	594	3483	3530	120
Grp Volume(v), veh/h	31	715	63	271	749	86	455	210	210	345	313	325
Grp Sat Flow(s),veh/h/ln	1795	1791	1514	1781	1777	1563	1742	1791	1761	1742	1791	1859
Q Serve(g_s), s	1.9	19.5	3.4	16.2	16.6	3.6	13.9	10.3	10.6	10.5	17.2	17.2
Cycle Q Clear(g_c), s	1.9	19.5	3.4	16.2	16.6	3.6	13.9	10.3	10.6	10.5	17.2	17.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.34	1.00		0.06
Lane Grp Cap(c), veh/h	40	1009	426	302	1524	671	520	506	498	414	452	469
V/C Ratio(X)	0.77	0.71	0.15	0.90	0.49	0.13	0.88	0.41	0.42	0.83	0.69	0.69
Avail Cap(c_a), veh/h	99	1251	529	442	1928	848	608	642	632	640	659	684
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.9	35.1	29.3	44.2	22.5	18.8	45.3	31.7	32.0	46.9	36.8	36.9
Incr Delay (d2), s/veh	11.0	0.9	0.1	11.9	0.1	0.0	10.9	0.2	0.2	3.1	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	8.2	1.2	7.9	6.5	1.3	6.6	4.3	4.4	4.6	7.3	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.9	36.0	29.3	56.1	22.6	18.8	56.2	31.9	32.2	50.0	37.5	37.6
LnGrp LOS	E	D	C	E	C	B	E	C	C	D	D	D
Approach Vol, veh/h	809			1106			875			983		
Approach Delay, s/veh	36.5			30.5			44.6			41.9		
Approach LOS	D			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.9	34.7	22.5	34.6	20.2	31.5	6.4	50.7				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+I1), s	12.5	12.6	18.2	21.5	15.9	19.2	3.9	18.6				
Green Ext Time (p_c), s	0.4	1.4	0.3	2.7	0.3	2.1	0.0	3.4				

### Intersection Summary












HCM 6th Ctrl Delay	38.0
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	559	7	31	842	146	36	59	25	310	78	194
Future Volume (veh/h)	154	559	7	31	842	146	36	59	25	310	78	194
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	173	628	2	35	946	42	40	66	7	348	88	67
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	205	1447	636	54	1648	509	61	401	42	465	797	349
Arrive On Green	0.11	0.41	0.41	0.03	0.32	0.32	0.03	0.12	0.10	0.13	0.22	0.22
Sat Flow, veh/h	1781	3554	1562	1781	5106	1578	1795	3272	342	3483	3582	1567
Grp Volume(v), veh/h	173	628	2	35	946	42	40	36	37	348	88	67
Grp Sat Flow(s),veh/h/ln	1781	1777	1562	1781	1702	1578	1795	1791	1822	1742	1791	1567
Q Serve(g_s), s	5.0	6.7	0.0	1.0	8.0	1.0	1.2	0.9	1.0	5.0	1.0	1.8
Cycle Q Clear(g_c), s	5.0	6.7	0.0	1.0	8.0	1.0	1.2	0.9	1.0	5.0	1.0	1.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	205	1447	636	54	1648	509	61	220	224	465	797	349
V/C Ratio(X)	0.85	0.43	0.00	0.64	0.57	0.08	0.66	0.16	0.17	0.75	0.11	0.19
Avail Cap(c_a), veh/h	205	3149	1384	205	4524	1398	206	1532	1559	467	3132	1371
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.7	11.2	9.2	25.1	14.7	12.3	25.0	20.5	20.6	21.8	16.2	16.5
Incr Delay (d2), s/veh	25.3	0.1	0.0	4.7	0.1	0.0	4.5	0.1	0.1	5.8	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	1.9	0.0	0.4	2.4	0.3	0.5	0.3	0.4	2.1	0.4	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.0	11.2	9.2	29.7	14.8	12.3	29.5	20.6	20.8	27.6	16.2	16.6
LnGrp LOS	D	B	A	C	B	B	C	C	C	C	B	B
Approach Vol, veh/h	803					1023		113		503		
Approach Delay, s/veh	19.2					15.2		23.8		24.1		
Approach LOS	B					B		C		C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.4	5.6	25.3	5.8	15.6	10.0	20.9					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	6.0	45.0	6.0	44.4	6.0	45.0					
Max Q Clear Time (g_c+11), s	3.0	3.0	8.7	3.2	3.8	7.0	10.0					
Green Ext Time (p_c), s	0.0	0.2	0.0	2.6	0.0	0.4	0.0	4.4				

### Intersection Summary

HCM 6th Ctrl Delay	18.8
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1007	482	111	1232	0	0	0	0	350	2	567
Future Volume (veh/h)	0	1007	482	111	1232	0	0	0	0	350	2	567
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1095	123	121	1339	0				381	0	587
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	1	1	0				2	2	2
Cap, veh/h	0	1635	507	162	2368	0				1492	0	664
Arrive On Green	0.00	0.32	0.32	0.08	0.46	0.00				0.42	0.00	0.42
Sat Flow, veh/h	0	5316	1596	1975	5316	0				3563	0	1585
Grp Volume(v), veh/h	0	1095	123	121	1339	0				381	0	587
Grp Sat Flow(s),veh/h/ln	0	1716	1596	987	1716	0				1781	0	1585
Q Serve(g_s), s	0.0	12.2	3.8	4.0	12.6	0.0				4.6	0.0	22.6
Cycle Q Clear(g_c), s	0.0	12.2	3.8	4.0	12.6	0.0				4.6	0.0	22.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1635	507	162	2368	0				1492	0	664
V/C Ratio(X)	0.00	0.67	0.24	0.75	0.57	0.00				0.26	0.00	0.88
Avail Cap(c_a), veh/h	0	3580	1110	478	5137	0				3556	0	1582
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.6	16.7	29.7	13.0	0.0				12.5	0.0	17.7
Incr Delay (d2), s/veh	0.0	0.2	0.1	2.6	0.1	0.0				0.0	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.2	1.2	0.9	3.8	0.0				1.5	0.0	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.7	16.8	32.3	13.1	0.0				12.5	0.0	19.3
LnGrp LOS	A	B	B	C	B	A				B	A	B
Approach Vol, veh/h		1218			1460						968	
Approach Delay, s/veh		19.4			14.7						16.7	
Approach LOS		B			B						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	9.4	25.0		31.7		34.4						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	60.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I10), s	10.0	14.2		24.6		14.6						
Green Ext Time (p_c), s	0.1	5.4		1.8		7.1						

### Intersection Summary

HCM 6th Ctrl Delay 16.8  
HCM 6th LOS B

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1006	351	36	831	451	512	24	176	0	0	0
Future Volume (veh/h)	0	1006	351	36	831	451	512	24	176	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	0	1093	122	39	903	229	576	0	51			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2			
Cap, veh/h	0	2074	643	63	2764	834	921	0	409			
Arrive On Green	0.00	0.41	0.41	0.04	0.54	0.54	0.26	0.00	0.26			
Sat Flow, veh/h	0	5274	1583	1781	5106	1541	3563	0	1583			
Grp Volume(v), veh/h	0	1093	122	39	903	229	576	0	51			
Grp Sat Flow(s),veh/h/ln	0	1702	1583	1781	1702	1541	1781	0	1583			
Q Serve(g_s), s	0.0	6.5	2.0	0.9	3.9	3.2	5.7	0.0	1.0			
Cycle Q Clear(g_c), s	0.0	6.5	2.0	0.9	3.9	3.2	5.7	0.0	1.0			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2074	643	63	2764	834	921	0	409			
V/C Ratio(X)	0.00	0.53	0.19	0.62	0.33	0.27	0.63	0.00	0.12			
Avail Cap(c_a), veh/h	0	6129	1900	490	8044	2427	4365	0	1940			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	9.0	7.6	19.0	5.1	4.9	13.1	0.0	11.4			
Incr Delay (d2), s/veh	0.0	0.1	0.1	3.7	0.0	0.1	0.3	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	1.4	0.4	0.3	0.6	0.4	1.6	0.0	0.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	9.1	7.7	22.8	5.1	5.0	13.4	0.0	11.4			
LnGrp LOS	A	A	A	C	A	A	B	A	B			
Approach Vol, veh/h		1215			1171			627				
Approach Delay, s/veh		8.9			5.7			13.2				
Approach LOS		A			A			B				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.4	20.2		14.3		25.6						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	1.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+I), s	12.5	8.5		7.7		5.9						
Green Ext Time (p_c), s	0.0	5.5		1.1		4.6						

## Intersection Summary

HCM 6th Ctrl Delay	8.6
HCM 6th LOS	A

## Notes

User approved volume balancing among the lanes for turning movement.











# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	86	5	8	58	338	5	131	11	242	96	22
Future Volume (veh/h)	39	86	5	8	58	338	5	131	11	242	96	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.95	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	46	102	4	10	69	223	6	156	6	288	114	18
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	137	463	18	136	98	315	138	556	21	355	865	134
Arrive On Green	0.08	0.26	0.26	0.08	0.26	0.26	0.08	0.16	0.13	0.20	0.28	0.25
Sat Flow, veh/h	1781	1786	70	1767	377	1217	1795	3510	134	1795	3101	479
Grp Volume(v), veh/h	46	0	106	10	0	292	6	79	83	288	65	67
Grp Sat Flow(s),veh/h/ln	1781	0	1856	1767	0	1594	1795	1791	1853	1795	1791	1789
Q Serve(g_s), s	1.3	0.0	2.3	0.3	0.0	8.6	0.2	2.0	2.0	8.0	1.4	1.5
Cycle Q Clear(g_c), s	1.3	0.0	2.3	0.3	0.0	8.6	0.2	2.0	2.0	8.0	1.4	1.5
Prop In Lane	1.00		0.04	1.00		0.76	1.00		0.07	1.00		0.27
Lane Grp Cap(c), veh/h	137	0	481	136	0	413	138	284	294	355	500	499
V/C Ratio(X)	0.34	0.00	0.22	0.07	0.00	0.71	0.04	0.28	0.28	0.81	0.13	0.13
Avail Cap(c_a), veh/h	377	0	1287	374	0	1104	726	1758	1819	726	1758	1756
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.7	0.0	15.1	22.3	0.0	17.5	22.2	19.2	19.3	19.9	14.0	14.2
Incr Delay (d2), s/veh	0.5	0.0	0.1	0.1	0.0	0.8	0.0	0.2	0.2	1.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.8	0.1	0.0	2.6	0.1	0.7	0.8	2.9	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.2	0.0	15.2	22.3	0.0	18.3	22.2	19.4	19.5	21.6	14.0	14.2
LnGrp LOS	C	A	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	152					302		168		420		
Approach Delay, s/veh	17.6					18.4		19.6		19.3		
Approach LOS	B					B		B		B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.3	12.2	8.0	17.4	8.0	18.5	8.0	17.4				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	4.0	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+I10), s	4.0	4.0	2.3	4.3	2.2	3.5	3.3	10.6				
Green Ext Time (p_c), s	0.3	0.5	0.0	0.3	0.0	0.4	0.0	1.1				

## Intersection Summary

HCM 6th Ctrl Delay 18.8

HCM 6th LOS B











# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	173	180	223	162	125	117	631	127	84	888	59
Future Volume (veh/h)	118	173	180	223	162	125	117	631	127	84	888	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	130	190	163	245	178	111	129	693	129	92	976	61
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	163	217	186	282	322	201	160	1093	203	118	1160	73
Arrive On Green	0.09	0.23	0.23	0.16	0.30	0.30	0.09	0.36	0.35	0.07	0.34	0.32
Sat Flow, veh/h	1795	930	798	1781	1068	666	1795	3012	560	1795	3417	214
Grp Volume(v), veh/h	130	0	353	245	0	289	129	412	410	92	511	526
Grp Sat Flow(s),veh/h/ln	1795	0	1727	1781	0	1734	1795	1791	1781	1795	1791	1840
Q Serve(g_s), s	6.3	0.0	17.6	12.0	0.0	12.5	6.3	17.0	17.0	4.5	23.5	23.6
Cycle Q Clear(g_c), s	6.3	0.0	17.6	12.0	0.0	12.5	6.3	17.0	17.0	4.5	23.5	23.6
Prop In Lane	1.00		0.46	1.00		0.38	1.00		0.31	1.00		0.12
Lane Grp Cap(c), veh/h	163	0	403	282	0	522	160	650	647	118	608	625
V/C Ratio(X)	0.80	0.00	0.88	0.87	0.00	0.55	0.81	0.63	0.63	0.78	0.84	0.84
Avail Cap(c_a), veh/h	302	0	659	400	0	759	181	763	759	242	824	846
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.7	0.0	32.9	36.6	0.0	26.1	39.8	23.5	23.7	41.0	27.2	27.3
Incr Delay (d2), s/veh	3.4	0.0	4.3	10.4	0.0	0.3	18.1	0.7	0.7	4.1	4.5	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	7.3	5.7	0.0	4.8	3.4	6.7	6.7	2.0	9.9	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.2	0.0	37.2	47.0	0.0	26.5	57.9	24.2	24.4	45.1	31.7	31.6
LnGrp LOS	D	A	D	D	A	C	E	C	C	D	C	C
Approach Vol, veh/h	483		534			951			1129			
Approach Delay, s/veh	38.8		35.9			28.9			32.8			
Approach LOS	D		D			C			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	36.4	18.1	24.8	12.0	34.3	12.1	30.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	2.0	36.7	20.0	34.0	9.0	39.7	15.0	39.0				
Max Q Clear Time (g_c+10), s	16.5	19.0	14.0	19.6	8.3	25.6	8.3	14.5				
Green Ext Time (p_c), s	0.0	2.8	0.2	1.1	0.0	3.4	0.1	1.0				

### Intersection Summary










HCM 6th Ctrl Delay	33.0
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	0	20	8	0	57	5	769	41	300	963	52
Future Volume (veh/h)	91	0	20	8	0	57	5	769	41	300	963	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	0	1900	1870	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	99	0	-18	9	0	0	5	884	13	345	1107	54
Peak Hour Factor	0.92	0.92	0.92	0.87	0.92	0.87	0.92	0.87	0.87	0.87	0.87	0.92
Percent Heavy Veh, %	2	2	2	0	0	0	2	1	1	1	1	1
Cap, veh/h	168	0	515	43	0	0	34	1361	591	423	2074	101
Arrive On Green	0.09	0.00	0.00	0.02	0.00	0.00	0.02	0.38	0.38	0.24	0.60	0.57
Sat Flow, veh/h	1781	1870	0	1810	9		1781	3582	1556	1795	3476	170
Grp Volume(v), veh/h	99	-18	-18	9	22.1		5	884	13	345	570	591
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1810	C		1781	1791	1556	1795	1791	1855
Q Serve(g_s), s	2.2	0.0	0.0	0.2			0.1	8.4	0.2	7.5	7.8	7.8
Cycle Q Clear(g_c), s	2.2	0.0	0.0	0.2			0.1	8.4	0.2	7.5	7.8	7.8
Prop In Lane	1.00		0.00	1.00			1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	168	0	0	43			34	1361	591	423	1069	1107
V/C Ratio(X)	0.59	0.00	0.00	0.21			0.15	0.65	0.02	0.82	0.53	0.53
Avail Cap(c_a), veh/h	474	0	0	241			237	2945	1279	1085	2317	2399
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	0.0	0.0	19.8			20.0	10.6	8.0	15.0	4.9	5.0
Incr Delay (d2), s/veh	3.3	0.0	0.0	2.3			2.0	0.2	0.0	1.5	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.1			0.1	2.1	0.0	2.4	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	0.0	0.0	22.1			22.0	10.8	8.0	16.4	5.1	5.1
LnGrp LOS	C	A	A	C			C	B	A	B	A	A
Approach Vol, veh/h	63						902				1506	
Approach Delay, s/veh	33.4						10.8				7.7	
Approach LOS	C						B				A	
Timer - Assigned Phs	1	2	3	4	5	6	7					
Phs Duration (G+Y+Rc), s	3.7	19.7	5.0	2.9	4.8	28.7	7.9					
Change Period (Y+Rc), s	4.0	5.3	4.5	4.5	4.5	5.3	4.5					
Max Green Setting (Gmax), s	25.0	32.7	5.0	39.0	5.0	52.2	10.5					
Max Q Clear Time (g_c+I), s	19.5	10.4	2.2	0.0	2.1	9.8	4.2					
Green Ext Time (p_c), s	0.4	3.8	0.0	0.0	0.0	4.8	0.1					

### Intersection Summary










HCM 6th Ctrl Delay	9.5
HCM 6th LOS	A

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	0	34	32	0	309	19	345	37	370	475	39
Future Volume (veh/h)	110	0	34	32	0	309	19	345	37	370	475	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	136	0	-43	40	0	0	23	426	37	457	586	46
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	212	5	4	107	5	0	41	814	70	552	1775	139
Arrive On Green	0.12	0.00	0.00	0.06	0.00	0.00	0.02	0.24	0.21	0.31	0.53	0.49
Sat Flow, veh/h	1810	1900	1610	1795	1885	0	1810	3355	290	1795	3365	264
Grp Volume(v), veh/h	136	0	-43	40	0	0	23	228	235	457	311	321
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1795	1885	0	1810	1805	1840	1795	1791	1838
Q Serve(g_s), s	2.6	0.0	0.0	0.8	0.0	0.0	0.5	4.0	4.0	8.5	3.6	3.6
Cycle Q Clear(g_c), s	2.6	0.0	0.0	0.8	0.0	0.0	0.5	4.0	4.0	8.5	3.6	3.6
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.16	1.00		0.14
Lane Grp Cap(c), veh/h	212	5	4	107	5	0	41	438	447	552	944	969
V/C Ratio(X)	0.64	0.00	-9.63	0.37	0.00	0.00	0.56	0.52	0.53	0.83	0.33	0.33
Avail Cap(c_a), veh/h	507	2013	1706	344	1830	0	301	1397	1424	1543	2627	2696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.2	0.0	0.0	16.3	0.0	0.0	17.4	11.8	11.9	11.6	4.9	4.9
Incr Delay (d2), s/veh	3.2	0.0	0.0	2.1	0.0	0.0	4.3	0.4	0.4	1.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.3	0.0	0.0	0.2	1.1	1.1	2.7	0.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.4	0.0	0.0	18.5	0.0	0.0	21.7	12.2	12.3	12.8	5.0	5.0
LnGrp LOS	B	A	A	B	A	A	C	B	B	B	A	A
Approach Vol, veh/h	93			40			486			1089		
Approach Delay, s/veh	27.0			18.5			12.7			8.3		
Approach LOS	C			B			B			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), \$5.1	12.8	6.2	2.1	4.8	23.0	8.2	0.0					
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0				
Max Green Setting (Gmax), s	1.0	26.6	6.4	38.2	6.0	51.6	9.6	35.0				
Max Q Clear Time (g_c+I10), s	10.5	6.0	2.8	0.0	2.5	5.6	4.6	0.0				
Green Ext Time (p_c), s	0.7	1.4	0.0	0.0	0.0	2.7	0.1	0.0				

### Intersection Summary









HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Existing Plus Phase 1 AM Peak Hour

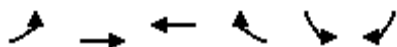







Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	7	0	4	7	0	4	3254	0	4	3254	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3647	0	1781	3647	0	1781	3647	0
Grp Volume(v), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	0	1781	1777	0	1781	1777	0
Q Serve(g_s), 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
Cycle Q Clear(g_c), 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
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	4	7	0	4	7	0	4	3254	0	4	3254	0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	581	3329	0	581	3329	0	581	3254	0	581	3254	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h	0		0				0		0			
Approach Delay, s/veh	0.0		0.0				0.0		0.0			
Approach LOS												
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	0.0	47.5	0.0	0.0	0.0	47.5	0.0	0.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	43.0	43.0	15.0	44.0	15.0	43.0	15.0	44.0				
Max Q Clear Time (g_c+I10), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			0.0									
HCM 6th LOS			A									

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

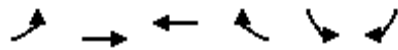
The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	4	8	8	0	1625	1446
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	7294	0	1781	1585
Grp Volume(v), veh/h	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	0	1781	1585
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	4	8	8	0	1625	1446
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	1224	6205	3453	0	1625	1446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		0	0		0	
Approach Delay, s/veh		0.0	0.0		0.0	
Approach LOS						
Timer - Assigned Phs			4		6	7 8
Phs Duration (G+Y+Rc), s			0.0		45.7	0.0 0.0
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			79.3		41.2	30.9 43.9
Max Q Clear Time (g_c+I1), s			0.0		0.0	0.0 0.0
Green Ext Time (p_c), s			0.0		0.0	0.0 0.0
Intersection Summary						
HCM 6th Ctrl Delay			0.0			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Existing Plus Phase 1 AM Peak Hour










Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1	0	314	769	1
Future Volume (veh/h)	0	1	0	314	769	1
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	0	1	0	20	905	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	398	174	174	148	1617	742
Arrive On Green	0.00	0.09	0.00	0.09	0.46	0.00
Sat Flow, veh/h	1392	1870	1870	1585	3483	1598
Grp Volume(v), veh/h	0	1	0	20	905	0
Grp Sat Flow(s), veh/h/ln	1392	1870	1870	1585	1742	1598
Q Serve(g_s), s	0.0	0.0	0.0	0.2	3.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.2	3.4	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	398	174	174	148	1617	742
V/C Ratio(X)	0.00	0.01	0.00	0.14	0.56	0.00
Avail Cap(c_a), veh/h	4583	5796	5796	4912	6939	3183
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	7.4	0.0	7.5	3.5	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	7.4	0.0	7.7	3.6	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		1	20		905	
Approach Delay, s/veh		7.4	7.7		3.6	
Approach LOS		A	A		A	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		5.7			5.7	12.4
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		54.7			54.7	34.7
Max Q Clear Time (g_c+I1), s		2.0			2.2	5.4
Green Ext Time (p_c), s		0.0			0.0	1.8
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			3.7			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	800	0	0	247	954	16	3	136	0	0	0
Future Volume (veh/h)	6	800	0	0	247	954	16	3	136	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No		No				No					
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	6	825	0	0	255	515	18	0	13			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	23	2824	0	0	681	1155	318	0	142			
Arrive On Green	0.01	0.55	0.00	0.00	0.36	0.36	0.09	0.00	0.09			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	6	825	0	0	255	515	18	0	13			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	0.0	1.9	0.0	0.0	2.2	2.7	0.1	0.0	0.2			
Cycle Q Clear(g_c), s	0.0	1.9	0.0	0.0	2.2	2.7	0.1	0.0	0.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	23	2824	0	0	681	1155	318	0	142			
V/C Ratio(X)	0.26	0.29	0.00	0.00	0.37	0.45	0.06	0.00	0.09			
Avail Cap(c_a), veh/h	2517	17430	0	0	4682	7936	7501	0	3337			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	10.9	2.7	0.0	0.0	5.2	5.4	9.2	0.0	9.2			
Incr Delay (d2), s/veh	2.2	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	2.7	0.0	0.0	5.3	5.5	9.2	0.0	9.3			
LnGrp LOS	B	A	A	A	A	A	A	A	A			
Approach Vol, veh/h	831		770			31						
Approach Delay, s/veh	2.8		5.4			9.3						
Approach LOS	A		A			A						
Timer - Assigned Phs	2		4		5	6						
Phs Duration (G+Y+Rc), s	16.2		6.0		4.1	12.0						
Change Period (Y+Rc), s	5.3		5.3		4.0	5.3						
Max Green Setting (Gmax), s	73.7		45.7		16.0	53.7						
Max Q Clear Time (g_c+l1), s	3.9		2.2		2.0	4.7						
Green Ext Time (p_c), s	3.7		0.0		0.0	2.0						

### Intersection Summary




HCM 6th Ctrl Delay	4.2
HCM 6th LOS	A

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

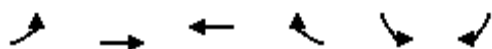
The Ranch  
Existing Plus Phase 1 AM Peak Hour

Intersection						
Int Delay, s/veh	18.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	79	364	26	30	422	38
Future Vol, veh/h	79	364	26	30	422	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	84	387	28	32	449	40
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	982	44	0	0	60	0
Stage 1	44	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	279	1032	-	-	1556	-
Stage 1	984	-	-	-	-	-
Stage 2	384	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	197	1032	-	-	1556	-
Mov Cap-2 Maneuver	197	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	271	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	31.3	0		7.6		
HCM LOS	D					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 588		1556	-	
HCM Lane V/C Ratio	-	- 0.801		0.289	-	
HCM Control Delay (s)	-	- 31.3		8.2	0	
HCM Lane LOS	-	- D		A	A	
HCM 95th %tile Q(veh)	-	- 7.9		1.2	-	



# HCM 6th Signalized Intersection Summary 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Existing Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↰↰↰	↱	↰	↰↰	
Traffic Volume (veh/h)	230	1204	724	77	349	746	
Future Volume (veh/h)	230	1204	724	77	349	746	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1870	1870	1796	1796	
Adj Flow Rate, veh/h	250	1309	787	0	379	496	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	1	1	2	2	7	7	
Cap, veh/h	309	1466	1446		882	1382	
Arrive On Green	0.09	0.41	0.28	0.00	0.52	0.52	
Sat Flow, veh/h	3483	3676	5274	1585	1711	2679	
Grp Volume(v), veh/h	250	1309	787	0	379	496	
Grp Sat Flow(s),veh/h/ln	1742	1791	1702	1585	1711	1340	
Q Serve(g_s), s	8.5	40.8	15.7	0.0	16.5	13.2	
Cycle Q Clear(g_c), s	8.5	40.8	15.7	0.0	16.5	13.2	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	309	1466	1446		882	1382	
V/C Ratio(X)	0.81	0.89	0.54		0.43	0.36	
Avail Cap(c_a), veh/h	421	1955	1979		882	1382	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	53.7	33.0	36.5	0.0	18.1	17.3	
Incr Delay (d2), s/veh	5.9	3.7	0.1	0.0	0.1	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.9	17.4	6.3	0.0	6.5	12.3	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	59.6	36.7	36.6	0.0	18.2	17.3	
LnGrp LOS	E	D	D		B	B	
Approach Vol, veh/h		1559	787	A	875		
Approach Delay, s/veh		40.4	36.6		17.7		
Approach LOS		D	D		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				53.6	66.4	15.1	38.5
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				65.5	45.5	14.5	46.5
Max Q Clear Time (g_c+I1), s				42.8	18.5	10.5	17.7
Green Ext Time (p_c), s				6.3	1.8	0.2	3.4
Intersection Summary							
HCM 6th Ctrl Delay			33.3				
HCM 6th LOS			C				

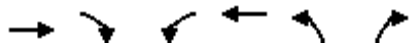
## Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary

## 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Existing Plus Phase 1 AM Peak Hour

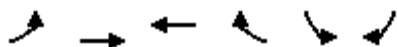


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	968	584	0	1319	109	21
Future Volume (veh/h)	968	584	0	1319	109	21
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1052	342	0	1434	118	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1725	769	0	1725	1548	710
Arrive On Green	0.49	0.49	0.00	0.49	0.45	0.45
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1052	342	0	1434	118	7
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	26.0	17.0	0.0	41.8	2.3	0.3
Cycle Q Clear(g_c), s	26.0	17.0	0.0	41.8	2.3	0.3
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1725	769	0	1725	1548	710
V/C Ratio(X)	0.61	0.44	0.00	0.83	0.08	0.01
Avail Cap(c_a), veh/h	2636	1176	0	2636	1548	710
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.6	20.3	0.0	26.6	18.9	18.4
Incr Delay (d2), s/veh	0.4	0.4	0.0	1.4	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.8	6.3	0.0	16.7	1.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	22.9	20.7	0.0	28.1	19.0	18.4
LnGrp LOS	C	C	A	C	B	B
Approach Vol, veh/h	1394			1434	125	
Approach Delay, s/veh	22.4			28.1	19.0	
Approach LOS	C			C	B	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	57.7			62.3		62.3
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	22.5			88.5		88.5
Max Q Clear Time (g_c+I1), s	4.3			28.0		43.8
Green Ext Time (p_c), s	0.3			12.6		14.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			25.0			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Prewett Ranch Drive & Hillcrest Avenue

The Ranch  
Existing Plus Phase 1 AM Peak Hour





















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	197	40	43	5	5	142
Future Volume (veh/h)	197	40	43	5	5	142
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	229	47	50	6	6	165
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	321	863	200	24	391	348
Arrive On Green	0.18	0.46	0.12	0.10	0.22	0.22
Sat Flow, veh/h	1781	1870	1638	197	1781	1585
Grp Volume(v), veh/h	229	47	0	56	6	165
Grp Sat Flow(s), veh/h/ln	1781	1870	0	1835	1781	1585
Q Serve(g_s), s	3.0	0.3	0.0	0.7	0.1	2.3
Cycle Q Clear(g_c), s	3.0	0.3	0.0	0.7	0.1	2.3
Prop In Lane	1.00			0.11	1.00	1.00
Lane Grp Cap(c), veh/h	321	863	0	224	391	348
V/C Ratio(X)	0.71	0.05	0.00	0.25	0.02	0.47
Avail Cap(c_a), veh/h	391	2089	0	1354	1350	1201
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.7	3.7	0.0	10.0	7.7	8.5
Incr Delay (d2), s/veh	4.8	0.0	0.0	0.6	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	0.2	0.0	2.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.4	3.8	0.0	10.6	7.7	9.5
LnGrp LOS	B	A	A	B	A	A
Approach Vol, veh/h		276	56		171	
Approach Delay, s/veh		12.6	10.6		9.5	
Approach LOS		B	B		A	
Timer - Assigned Phs			4		6	7 8
Phs Duration (G+Y+Rc), s			15.6		9.5	8.5 7.1
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			27.5		18.5	5.0 18.0
Max Q Clear Time (g_c+I1), s			2.3		4.3	5.0 2.7
Green Ext Time (p_c), s			0.2		0.4	0.0 0.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			11.3			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Existing Plus Phase 1 PM Peak Hour







												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	193	0	232	616	720	0	0	563	421
Future Volume (veh/h)	0	0	0	193	0	232	616	720	0	0	563	421
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				197	0	43	629	735	0	0	574	116
Peak Hour Factor				0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %				1	0	1	1	1	0	0	1	1
Cap, veh/h				511	0	234	889	2223	0	0	1614	396
Arrive On Green				0.15	0.00	0.15	0.26	0.62	0.00	0.00	0.25	0.25
Sat Flow, veh/h				3483	0	1598	3483	3676	0	0	6749	1591
Grp Volume(v), veh/h				197	0	43	629	735	0	0	574	116
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1742	1791	0	0	1621	1591
Q Serve(g_s), s				1.8	0.0	0.8	5.6	3.4	0.0	0.0	2.5	2.0
Cycle Q Clear(g_c), s				1.8	0.0	0.8	5.6	3.4	0.0	0.0	2.5	2.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				511	0	234	889	2223	0	0	1614	396
V/C Ratio(X)				0.39	0.00	0.18	0.71	0.33	0.00	0.00	0.36	0.29
Avail Cap(c_a), veh/h				4358	0	1999	4561	9277	0	0	7549	1852
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				13.3	0.0	12.9	11.6	3.1	0.0	0.0	10.6	10.5
Incr Delay (d2), s/veh				0.2	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.5	0.0	0.2	1.4	0.0	0.0	0.0	0.6	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				13.4	0.0	13.0	12.0	3.1	0.0	0.0	10.7	10.6
LnGrp LOS				B	A	B	B	A	A	A	B	B
Approach Vol, veh/h					240			1364			690	
Approach Delay, s/veh					13.4			7.2			10.7	
Approach LOS					B			A			B	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	25.3			12.8			12.6			9.0		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	5.4			7.6			4.5			3.8		
Green Ext Time (p_c), s	3.2			1.2			2.6			0.4		
Intersection Summary												
HCM 6th Ctrl Delay	8.9											
HCM 6th LOS	A											

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	455	0	787	0	0	0	0	881	255	269	486	0
Future Volume (veh/h)	455	0	787	0	0	0	0	881	255	269	486	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	474	0	820				0	918	230	280	506	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1327	0	1181				0	1566	385	406	1663	0
Arrive On Green	0.37	0.00	0.37				0.00	0.30	0.28	0.12	0.46	0.00
Sat Flow, veh/h	3591	0	3195				0	5492	1284	3483	3676	0
Grp Volume(v), veh/h	474	0	820				0	853	295	280	506	0
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1621	1649	1742	1791	0
Q Serve(g_s), s	5.4	0.0	12.2				0.0	8.3	8.7	4.3	4.9	0.0
Cycle Q Clear(g_c), s	5.4	0.0	12.2				0.0	8.3	8.7	4.3	4.9	0.0
Prop In Lane	1.00		1.00				0.00		0.78	1.00		0.00
Lane Grp Cap(c), veh/h	1327	0	1181				0	1457	494	406	1663	0
V/C Ratio(X)	0.36	0.00	0.69				0.00	0.59	0.60	0.69	0.30	0.00
Avail Cap(c_a), veh/h	5452	0	4851				0	2606	884	809	3007	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.8	0.0	15.0				0.0	16.7	17.2	23.8	9.4	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.7				0.0	0.1	0.4	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	3.6				0.0	2.6	2.8	1.6	1.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.0	0.0	15.7				0.0	16.8	17.6	24.5	9.4	0.0
LnGrp LOS	B	A	B				A	B	B	C	A	A
Approach Vol, veh/h	1294						1148			786		
Approach Delay, s/veh	14.7						17.0			14.8		
Approach LOS	B						B			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	20.8		24.7		31.3							
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	28.7	28.7		84.5		* 47						
Max Q Clear Time (g_c+I10), s	10.7	10.7		14.2		6.9						
Green Ext Time (p_c), s	0.3	4.6		6.0		2.0						

### Intersection Summary

HCM 6th Ctrl Delay 15.5  
HCM 6th LOS B

### Notes

User approved volume balancing among the lanes for turning movement.















\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	 		 	
Traffic Volume (veh/h)	33	18	101	743	91	162	162	556	772	50	527	29
Future Volume (veh/h)	33	18	101	743	91	162	162	556	772	50	527	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	19	12	766	94	124	167	573	253	52	543	27
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	54	99	63	1060	200	264	216	1003	777	147	839	42
Arrive On Green	0.03	0.09	0.08	0.21	0.27	0.26	0.12	0.28	0.28	0.08	0.24	0.22
Sat Flow, veh/h	1781	1065	673	5023	732	965	1781	3554	2751	1781	3445	171
Grp Volume(v), veh/h	34	0	31	766	0	218	167	573	253	52	280	290
Grp Sat Flow(s),veh/h/ln	1781	0	1737	1674	0	1697	1781	1777	1376	1781	1777	1840
Q Serve(g_s), s	0.9	0.0	0.8	6.9	0.0	5.2	4.4	6.7	3.5	1.3	6.8	6.9
Cycle Q Clear(g_c), s	0.9	0.0	0.8	6.9	0.0	5.2	4.4	6.7	3.5	1.3	6.8	6.9
Prop In Lane	1.00		0.39	1.00		0.57	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	54	0	162	1060	0	465	216	1003	777	147	433	448
V/C Ratio(X)	0.63	0.00	0.19	0.72	0.00	0.47	0.77	0.57	0.33	0.35	0.65	0.65
Avail Cap(c_a), veh/h	368	0	1185	2077	0	1508	847	4922	3810	147	1763	1825
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	0.0	20.4	17.8	0.0	14.8	20.6	14.9	13.7	21.0	16.4	16.5
Incr Delay (d2), s/veh	4.4	0.0	0.2	0.4	0.0	0.3	2.2	0.2	0.1	0.5	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.3	2.2	0.0	1.6	1.6	2.1	0.9	0.5	2.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.6	0.0	20.6	18.1	0.0	15.1	22.8	15.0	13.8	21.5	17.0	17.1
LnGrp LOS	C	A	C	B	A	B	C	B	B	C	B	B
Approach Vol, veh/h	65			984			993			622		
Approach Delay, s/veh	24.3			17.4			16.0			17.4		
Approach LOS	C			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	17.7	14.2	8.5	9.9	15.8	5.5	17.2				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	66.1	20.0	32.4	23.0	47.1	10.0	42.4				
Max Q Clear Time (g_c+I), s	13.3	8.7	8.9	2.8	6.4	8.9	2.9	7.2				
Green Ext Time (p_c), s	0.0	2.9	1.3	0.1	0.2	1.9	0.0	0.8				

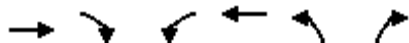
### Intersection Summary

HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Existing Plus Phase 1 PM Peak Hour








Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	235	605	48	488	508	87
Future Volume (veh/h)	235	605	48	488	508	87
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	245	210	50	508	529	16
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	936	413	254	887	813	373
Arrive On Green	0.27	0.27	0.07	0.48	0.24	0.24
Sat Flow, veh/h	3589	1545	3401	1841	3401	1560
Grp Volume(v), veh/h	245	210	50	508	529	16
Grp Sat Flow(s), veh/h/ln	1749	1545	1700	1841	1700	1560
Q Serve(g_s), s	1.6	3.3	0.4	5.7	4.0	0.2
Cycle Q Clear(g_c), s	1.6	3.3	0.4	5.7	4.0	0.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	936	413	254	887	813	373
V/C Ratio(X)	0.26	0.51	0.20	0.57	0.65	0.04
Avail Cap(c_a), veh/h	4272	1888	665	2865	2065	947
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.3	8.9	12.4	5.3	9.8	8.4
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.6	0.1	0.4	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.3	9.3	12.8	5.5	10.2	8.4
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	455			558	545	
Approach Delay, s/veh	8.8			6.2	10.1	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		10.8	6.1	11.7		17.8
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		17.4	5.1	34.4		44.0
Max Q Clear Time (g_c+I1), s		6.0	2.4	5.3		7.7
Green Ext Time (p_c), s		0.9	0.0	1.2		1.8
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			8.3			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	0	1424	0	0	0	0	1185	435	333	832	0
Future Volume (veh/h)	305	0	1424	0	0	0	0	1185	435	333	832	0
Initial Q (Qb), veh	0	0	20				0	20	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	0	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	311	0	1019				0	1209	387	340	849	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	0	1				0	1	1	1	1	0
Cap, veh/h	928	0	700				0	1665	491	419	3351	0
Arrive On Green	0.31	0.00	0.31				0.00	0.41	0.40	0.12	0.59	0.00
Sat Flow, veh/h	3483	0	3643				0	4585	1222	3483	5316	0
Grp Volume(v), veh/h	311	0	1019				0	1070	526	340	849	0
Grp Sat Flow(s),veh/h/ln	1742	0	1214				0	1131	1660	1742	1716	0
Q Serve(g_s), s	5.7	0.0	22.4				0.0	22.7	22.9	7.9	6.7	0.0
Cycle Q Clear(g_c), s	5.7	0.0	22.4				0.0	22.7	22.9	7.9	6.7	0.0
Prop In Lane	1.00		1.00				0.00		0.74	1.00		0.00
Lane Grp Cap(c), veh/h	928	0	700				0	1438	698	419	3351	0
V/C Ratio(X)	0.33	0.00	1.45				0.00	0.74	0.75	0.81	0.25	0.00
Avail Cap(c_a), veh/h	1083	0	1133				0	3288	1608	875	4987	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.6	0.0	54.6				0.0	21.5	21.7	44.1	7.1	0.0
Incr Delay (d2), s/veh	0.1	0.0	211.2				0.0	0.3	0.6	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	102.8				0.0	3.1	1.5	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	28.1				0.0	6.6	9.1	4.1	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	0.0	368.6				0.0	24.8	23.8	45.5	7.1	0.0
LnGrp LOS	C	A	F				A	C	C	D	A	A
Approach Vol, veh/h	1330						1596			1189		
Approach Delay, s/veh	289.8						24.5			18.1		
Approach LOS	F						C			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	5.3	38.4	29.9	53.7								
Change Period (Y+Rc), s	4.9	* 4.9	5.3	4.9								
Max Green Setting (Gmax), s	1.0	* 80	24.7	80.1								
Max Q Clear Time (g_c+19, s)	24.9	24.9	24.4	8.7								
Green Ext Time (p_c), s	0.5	8.7	0.1	3.9								

### Intersection Summary

HCM 6th Ctrl Delay	108.4
HCM 6th LOS	F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↱	↰	↱		↰	↱	↱
Traffic Volume (veh/h)	55	46	58	137	32	123	56	774	113	195	915	24
Future Volume (veh/h)	55	46	58	137	32	123	56	774	113	195	915	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	56	47	7	140	33	19	57	790	109	199	934	23
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	100	84	157	230	242	205	79	1101	152	329	1426	35
Arrive On Green	0.10	0.10	0.10	0.13	0.13	0.13	0.04	0.35	0.34	0.09	0.40	0.39
Sat Flow, veh/h	998	837	1574	1795	1885	1594	1795	3155	435	3483	3572	88
Grp Volume(v), veh/h	103	0	7	140	33	19	57	448	451	199	468	489
Grp Sat Flow(s), veh/h/ln	1835	0	1574	1795	1885	1594	1795	1791	1800	1742	1791	1869
Q Serve(g_s), s	2.6	0.0	0.2	3.6	0.8	0.5	1.5	10.6	10.6	2.7	10.4	10.4
Cycle Q Clear(g_c), s	2.6	0.0	0.2	3.6	0.8	0.5	1.5	10.6	10.6	2.7	10.4	10.4
Prop In Lane	0.54		1.00	1.00		1.00	1.00		0.24	1.00		0.05
Lane Grp Cap(c), veh/h	183	0	157	230	242	205	79	625	628	329	715	746
V/C Ratio(X)	0.56	0.00	0.04	0.61	0.14	0.09	0.72	0.72	0.72	0.60	0.65	0.65
Avail Cap(c_a), veh/h	1319	0	1131	1401	1471	1243	590	2757	2771	1144	2757	2877
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	0.0	19.8	20.1	18.8	18.7	23.0	13.8	13.8	21.2	11.9	11.9
Incr Delay (d2), s/veh	1.0	0.0	0.0	1.0	0.1	0.1	4.5	0.6	0.6	0.7	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.1	1.3	0.3	0.2	0.7	3.2	3.3	1.0	3.4	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	0.0	19.9	21.0	18.9	18.8	27.5	14.4	14.4	21.8	12.3	12.3
LnGrp LOS	C	A	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		110			192			956			1156	
Approach Delay, s/veh		21.8			20.5			15.2			13.9	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	21.0		8.9	6.2	23.5		10.3				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+14), s	14.7	12.6		4.6	3.5	12.4		5.6				
Green Ext Time (p_c), s	0.3	3.4		0.3	0.0	4.5		0.3				

### Intersection Summary











HCM 6th Ctrl Delay	15.3
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	162	101	39	84	503	117	766	33	747	1017	160
Future Volume (veh/h)	166	162	101	39	84	503	117	766	33	747	1017	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	171	167	37	40	87	519	121	790	33	770	1048	91
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	208	729	158	51	305	1297	270	1003	42	875	1334	749
Arrive On Green	0.12	0.25	0.24	0.03	0.16	0.15	0.15	0.29	0.27	0.25	0.37	0.36
Sat Flow, veh/h	1795	2928	634	1795	1885	3195	1795	3503	146	3483	3582	1576
Grp Volume(v), veh/h	171	101	103	40	87	519	121	404	419	770	1048	91
Grp Sat Flow(s),veh/h/ln	1795	1791	1771	1795	1885	1598	1795	1791	1858	1742	1791	1576
Q Serve(g_s), s	8.1	3.9	4.0	1.9	3.5	10.0	5.3	18.0	18.0	18.4	22.5	1.1
Cycle Q Clear(g_c), s	8.1	3.9	4.0	1.9	3.5	10.0	5.3	18.0	18.0	18.4	22.5	1.1
Prop In Lane	1.00		0.36	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	208	446	441	51	305	1297	270	513	532	875	1334	749
V/C Ratio(X)	0.82	0.23	0.23	0.78	0.29	0.40	0.45	0.79	0.79	0.88	0.79	0.12
Avail Cap(c_a), veh/h	456	1489	1473	228	1328	3032	270	1034	1073	1247	2896	1436
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.4	25.9	26.0	41.8	31.9	18.2	33.5	28.5	28.5	31.2	24.1	4.0
Incr Delay (d2), s/veh	3.1	0.1	0.1	9.2	0.2	0.1	0.4	1.0	1.0	4.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	1.6	1.6	0.9	1.5	3.3	2.2	7.2	7.5	8.0	9.1	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.4	26.0	26.1	50.9	32.1	18.3	34.0	29.5	29.5	35.3	24.5	4.1
LnGrp LOS	D	C	C	D	C	B	C	C	C	D	C	A
Approach Vol, veh/h	375				646				944		1909	
Approach Delay, s/veh	32.6				22.2				30.1		27.9	
Approach LOS	C				C				C		C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.8	28.8	6.5	25.6	18.3	36.2	14.0	18.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	21.0	48.7	11.0	71.4	11.0	* 69	22.0	60.4				
Max Q Clear Time (g_c+Tb), s	20.4	20.0	3.9	6.0	7.3	24.5	10.1	12.0				
Green Ext Time (p_c), s	1.4	2.9	0.0	0.7	0.0	6.3	0.2	1.4				

### Intersection Summary

HCM 6th Ctrl Delay 27.9  
HCM 6th LOS C

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	77	752	6	41	54	484	744	9	58	932	158
Future Volume (veh/h)	134	77	752	6	41	54	484	744	9	58	932	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	111	123	74	6	43	3	509	783	5	61	981	153
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	221	232	394	9	65	64	662	1801	783	79	1541	240
Arrive On Green	0.12	0.12	0.12	0.04	0.04	0.04	0.19	0.50	0.50	0.04	0.34	0.33
Sat Flow, veh/h	1795	1885	3195	229	1644	1598	3483	3582	1557	1795	4482	697
Grp Volume(v), veh/h	111	123	74	49	0	3	509	783	5	61	750	384
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1874	0	1598	1742	1791	1557	1795	1716	1748
Q Serve(g_s), s	3.2	3.4	1.1	1.4	0.0	0.1	7.6	7.7	0.1	1.9	10.1	10.2
Cycle Q Clear(g_c), s	3.2	3.4	1.1	1.4	0.0	0.1	7.6	7.7	0.1	1.9	10.1	10.2
Prop In Lane	1.00		1.00	0.12		1.00	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	221	232	394	75	0	64	662	1801	783	79	1180	601
V/C Ratio(X)	0.50	0.53	0.19	0.66	0.00	0.05	0.77	0.43	0.01	0.77	0.64	0.64
Avail Cap(c_a), veh/h	716	752	1275	1326	0	1130	1580	3508	1526	293	2365	1205
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.6	22.7	21.7	26.1	0.0	25.5	21.2	8.7	6.8	26.1	15.2	15.3
Incr Delay (d2), s/veh	0.7	0.7	0.1	3.6	0.0	0.1	0.7	0.1	0.0	5.8	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.3	0.4	0.6	0.0	0.0	2.7	2.0	0.0	0.9	3.5	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.2	23.4	21.8	29.7	0.0	25.6	21.9	8.8	6.8	31.9	15.4	15.7
LnGrp LOS	C	C	C	C	A	C	C	A	A	C	B	B
Approach Vol, veh/h	308			52			1297			1195		
Approach Delay, s/veh	22.9			29.5			13.9			16.4		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	31.7		10.8	14.5	23.7		6.2				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	20.0	52.7		21.1	25.0	* 37		39.0				
Max Q Clear Time (g_c+13, s)	9.7			5.4	9.6	12.2		3.4				
Green Ext Time (p_c), s	0.0	3.4		0.6	0.8	5.7		0.1				

### Intersection Summary

HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.













\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	977	260	106	738	39	209	54	85	48	31	78
Future Volume (veh/h)	104	977	260	106	738	39	209	54	85	48	31	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	108	1018	177	110	769	14	218	56	27	50	32	16
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	141	1361	600	174	1429	623	340	360	303	70	156	78
Arrive On Green	0.08	0.38	0.38	0.10	0.40	0.40	0.10	0.19	0.19	0.04	0.13	0.11
Sat Flow, veh/h	1795	3582	1578	1795	3582	1563	3483	1885	1585	1795	1182	591
Grp Volume(v), veh/h	108	1018	177	110	769	14	218	56	27	50	0	48
Grp Sat Flow(s),veh/h/ln	1795	1791	1578	1795	1791	1563	1742	1885	1585	1795	0	1773
Q Serve(g_s), s	3.2	13.4	4.3	3.2	9.0	0.3	3.3	1.4	0.8	1.5	0.0	1.3
Cycle Q Clear(g_c), s	3.2	13.4	4.3	3.2	9.0	0.3	3.3	1.4	0.8	1.5	0.0	1.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	141	1361	600	174	1429	623	340	360	303	70	0	234
V/C Ratio(X)	0.77	0.75	0.30	0.63	0.54	0.02	0.64	0.16	0.09	0.72	0.00	0.20
Avail Cap(c_a), veh/h	559	3476	1531	559	3476	1517	893	1553	1306	296	0	1299
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.7	14.7	11.8	23.7	12.6	10.0	23.7	18.4	18.2	25.9	0.0	21.3
Incr Delay (d2), s/veh	3.3	0.3	0.1	1.4	0.1	0.0	0.8	0.1	0.0	5.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	4.2	1.2	1.3	2.7	0.1	1.2	0.5	0.2	0.7	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	15.0	11.9	25.1	12.7	10.0	24.5	18.5	18.2	30.9	0.0	21.5
LnGrp LOS	C	B	B	C	B	A	C	B	B	C	A	C
Approach Vol, veh/h	1303			893			301			98		
Approach Delay, s/veh	15.6			14.2			22.8			26.3		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.1	14.4	9.3	24.8	9.3	11.2	8.3	25.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	43.7	43.7	17.0	* 53	14.0	38.7	17.0	* 53				
Max Q Clear Time (g_c+13.5), s	3.4	3.4	5.2	15.4	5.3	3.3	5.2	11.0				
Green Ext Time (p_c), s	0.0	0.2	0.1	5.1	0.2	0.1	0.1	3.4				

### Intersection Summary

HCM 6th Ctrl Delay 16.4

HCM 6th LOS B

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Existing Plus Phase 1 PM Peak Hour














Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	735	224	265	524	176	275	326	215	252	341	24
Future Volume (veh/h)	67	735	224	265	524	176	275	326	215	252	341	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	70	766	94	276	546	74	286	340	117	262	355	21
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	91	1094	475	321	1553	693	380	556	188	358	707	42
Arrive On Green	0.05	0.30	0.30	0.18	0.43	0.43	0.11	0.21	0.19	0.10	0.20	0.19
Sat Flow, veh/h	1810	3610	1567	1810	3610	1610	3510	2635	890	3510	3462	204
Grp Volume(v), veh/h	70	766	94	276	546	74	286	231	226	262	184	192
Grp Sat Flow(s),veh/h/ln	1810	1805	1567	1810	1805	1610	1755	1805	1721	1755	1805	1861
Q Serve(g_s), s	3.0	14.5	3.4	11.4	7.8	2.1	6.1	8.9	9.3	5.6	7.0	7.1
Cycle Q Clear(g_c), s	3.0	14.5	3.4	11.4	7.8	2.1	6.1	8.9	9.3	5.6	7.0	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.52	1.00		0.11
Lane Grp Cap(c), veh/h	91	1094	475	321	1553	693	380	380	363	358	369	380
V/C Ratio(X)	0.77	0.70	0.20	0.86	0.35	0.11	0.75	0.61	0.62	0.73	0.50	0.50
Avail Cap(c_a), veh/h	258	1962	851	585	2615	1167	636	957	913	727	1004	1035
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	23.8	20.0	30.9	14.8	13.1	33.5	27.6	28.0	33.7	27.2	27.3
Incr Delay (d2), s/veh	5.1	0.3	0.1	2.7	0.1	0.0	1.1	0.6	0.7	1.1	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.6	1.1	4.8	2.8	0.7	2.5	3.6	3.6	2.3	2.8	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.4	24.1	20.0	33.5	14.8	13.2	34.6	28.2	28.7	34.8	27.6	27.7
LnGrp LOS	D	C	C	C	B	B	C	C	C	C	C	C
Approach Vol, veh/h	930		896			743			638			
Approach Delay, s/veh	25.0		20.5			30.8			30.6			
Approach LOS	C		C			C			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	1.9	20.3	17.7	27.4	12.4	19.8	7.9	37.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	6.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7				
Max Q Clear Time (g_c+1), s	11.3	11.3	13.4	16.5	8.1	9.1	5.0	9.8				
Green Ext Time (p_c), s	0.3	1.5	0.3	3.3	0.3	1.2	0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay			26.2									
HCM 6th LOS			C									

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	171	874	15	74	921	227	31	51	40	523	91	98
Future Volume (veh/h)	171	874	15	74	921	227	31	51	40	523	91	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	178	910	6	77	959	62	32	53	8	545	95	26
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	223	1294	576	99	1505	460	49	437	64	670	1092	478
Arrive On Green	0.12	0.36	0.36	0.06	0.29	0.29	0.03	0.14	0.12	0.19	0.30	0.30
Sat Flow, veh/h	1795	3582	1594	1795	5147	1574	1795	3126	461	3483	3582	1568
Grp Volume(v), veh/h	178	910	6	77	959	62	32	30	31	545	95	26
Grp Sat Flow(s),veh/h/ln	1795	1791	1594	1795	1716	1574	1795	1791	1795	1742	1791	1568
Q Serve(g_s), s	6.1	13.8	0.2	2.7	10.3	1.8	1.1	0.9	1.0	9.5	1.2	0.7
Cycle Q Clear(g_c), s	6.1	13.8	0.2	2.7	10.3	1.8	1.1	0.9	1.0	9.5	1.2	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	223	1294	576	99	1505	460	49	250	251	670	1092	478
V/C Ratio(X)	0.80	0.70	0.01	0.78	0.64	0.13	0.66	0.12	0.12	0.81	0.09	0.05
Avail Cap(c_a), veh/h	395	2775	1235	310	3745	1145	141	1258	1261	1040	3304	1447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.1	17.4	13.0	29.7	19.6	16.6	30.7	23.9	24.1	24.6	15.8	15.6
Incr Delay (d2), s/veh	2.5	0.3	0.0	4.8	0.2	0.0	5.5	0.1	0.1	1.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	4.8	0.0	1.2	3.5	0.6	0.5	0.4	0.4	3.6	0.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.6	17.7	13.0	34.5	19.7	16.6	36.1	24.0	24.2	26.0	15.8	15.6
LnGrp LOS	C	B	B	C	B	B	D	C	C	C	B	B
Approach Vol, veh/h	1094			1098			93			666		
Approach Delay, s/veh	19.6			20.6			28.2			24.2		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.9	7.5	27.0	5.7	23.4	11.9	22.6					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	11.0	48.0	5.0	57.4	14.0	45.0					
Max Q Clear Time (g_c+I1), s	3.0	4.7	15.8	3.1	3.2	8.1	12.3					
Green Ext Time (p_c), s	0.7	0.2	0.0	4.1	0.0	0.4	0.1	4.5				

### Intersection Summary

HCM 6th Ctrl Delay	21.3
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1543	665	152	1574	0	0	0	0	674	3	659
Future Volume (veh/h)	0	1543	665	152	1574	0	0	0	0	674	3	659
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1624	292	160	1657	0				711	0	666
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1869	569	191	2542	0				1602	0	713
Arrive On Green	0.00	0.36	0.36	0.10	0.49	0.00				0.44	0.00	0.44
Sat Flow, veh/h	0	5358	1579	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	1624	292	160	1657	0				711	0	666
Grp Sat Flow(s),veh/h/ln	0	1729	1579	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	34.7	17.3	9.4	28.5	0.0				16.2	0.0	46.8
Cycle Q Clear(g_c), s	0.0	34.7	17.3	9.4	28.5	0.0				16.2	0.0	46.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1869	569	191	2542	0				1602	0	713
V/C Ratio(X)	0.00	0.87	0.51	0.84	0.65	0.00				0.44	0.00	0.93
Avail Cap(c_a), veh/h	0	2005	610	268	2877	0				2008	0	893
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	35.4	29.9	52.8	22.7	0.0				23.0	0.0	31.5
Incr Delay (d2), s/veh	0.0	3.9	0.3	10.9	0.3	0.0				0.1	0.0	13.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.5	6.3	2.6	10.9	0.0				6.6	0.0	19.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	39.3	30.1	63.7	23.0	0.0				23.1	0.0	44.7
LnGrp LOS	A	D	C	E	C	A				C	A	D
Approach Vol, veh/h		1916			1817						1377	
Approach Delay, s/veh		37.9			26.6						33.5	
Approach LOS		D			C						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.4	46.9		56.7		62.3						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	6.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I1), s	1.4	36.7		48.8		30.5						
Green Ext Time (p_c), s	0.1	4.9		2.6		9.4						

## Intersection Summary

HCM 6th Ctrl Delay	32.7
HCM 6th LOS	C

## Notes

User approved volume balancing among the lanes for turning movement.



# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1774	443	38	1043	453	683	38	243	0	0	0
Future Volume (veh/h)	0	1774	443	38	1043	453	683	38	243	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	0	1867	299	40	1098	265	748	0	109			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	1	1	1	1	1	1	1	1			
Cap, veh/h	0	2628	803	57	3115	940	966	0	430			
Arrive On Green	0.00	0.51	0.51	0.03	0.61	0.61	0.27	0.00	0.27			
Sat Flow, veh/h	0	5316	1573	1795	5147	1553	3591	0	1598			
Grp Volume(v), veh/h	0	1867	299	40	1098	265	748	0	109			
Grp Sat Flow(s),veh/h/ln	0	1716	1573	1795	1716	1553	1795	0	1598			
Q Serve(g_s), s	0.0	17.7	7.3	1.4	6.8	5.2	12.3	0.0	3.4			
Cycle Q Clear(g_c), s	0.0	17.7	7.3	1.4	6.8	5.2	12.3	0.0	3.4			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2628	803	57	3115	940	966	0	430			
V/C Ratio(X)	0.00	0.71	0.37	0.70	0.35	0.28	0.77	0.00	0.25			
Avail Cap(c_a), veh/h	0	3878	1185	310	5090	1536	2762	0	1229			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	12.0	9.4	30.5	6.3	6.0	21.5	0.0	18.3			
Incr Delay (d2), s/veh	0.0	0.1	0.1	5.6	0.0	0.1	0.5	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	5.0	1.9	0.6	1.6	1.1	4.5	0.0	1.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.1	9.5	36.2	6.3	6.0	22.0	0.0	18.4			
LnGrp LOS	A	B	A	D	A	A	C	A	B			
Approach Vol, veh/h		2166			1403			857				
Approach Delay, s/veh		11.7			7.1			21.5				
Approach LOS		B			A			C				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	6.0	36.5		21.1		42.6						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	1.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+I), s	13.4	19.7		14.3		8.8						
Green Ext Time (p_c), s	0.0	11.4		1.6		5.9						

### Intersection Summary

HCM 6th Ctrl Delay	12.2
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.











# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	51	0	9	47	160	5	53	9	189	97	38
Future Volume (veh/h)	34	51	0	9	47	160	5	53	9	189	97	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	37	55	-2	10	51	80	5	57	2	203	104	33
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	205	196	0	205	69	108	205	555	19	304	573	175
Arrive On Green	0.11	0.10	0.00	0.11	0.10	0.10	0.11	0.16	0.12	0.17	0.21	0.18
Sat Flow, veh/h	1795	1885	0	1795	661	1037	1795	3531	123	1795	2700	823
Grp Volume(v), veh/h	37	53	0	10	0	131	5	29	30	203	68	69
Grp Sat Flow(s),veh/h/ln	1795	1885	0	1795	0	1698	1795	1791	1863	1795	1791	1732
Q Serve(g_s), s	0.7	0.9	0.0	0.2	0.0	2.6	0.1	0.5	0.5	3.7	1.1	1.2
Cycle Q Clear(g_c), s	0.7	0.9	0.0	0.2	0.0	2.6	0.1	0.5	0.5	3.7	1.1	1.2
Prop In Lane	1.00		0.00	1.00		0.61	1.00		0.07	1.00		0.48
Lane Grp Cap(c), veh/h	205	196	0	205	0	176	205	282	293	304	380	368
V/C Ratio(X)	0.18	0.27	0.00	0.05	0.00	0.74	0.02	0.10	0.10	0.67	0.18	0.19
Avail Cap(c_a), veh/h	563	1934	0	563	0	1742	1074	2602	2707	1074	2602	2516
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.1	14.5	0.0	13.9	0.0	15.3	13.8	12.7	12.7	13.7	11.3	11.6
Incr Delay (d2), s/veh	0.2	0.3	0.0	0.0	0.0	2.3	0.0	0.1	0.1	1.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.0	0.1	0.0	0.8	0.0	0.1	0.1	1.1	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.2	14.8	0.0	13.9	0.0	17.6	13.8	12.7	12.8	14.6	11.4	11.7
LnGrp LOS	B	B	A	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	90			141			64			340		
Approach Delay, s/veh	14.5			17.3			12.8			13.4		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	9.5	8.0	7.6	8.0	11.5	8.0	7.6				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+15, s)	2.5	2.5	2.2	2.9	2.1	3.2	2.7	4.6				
Green Ext Time (p_c), s	0.2	0.2	0.0	0.1	0.0	0.4	0.0	0.4				

## Intersection Summary

HCM 6th Ctrl Delay 14.4









HCM 6th LOS B

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	105	80	62	90	72	150	605	157	107	622	88
Future Volume (veh/h)	65	105	80	62	90	72	150	605	157	107	622	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	70	113	66	67	97	48	161	651	153	115	669	86
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	96	155	91	93	164	81	211	1024	240	150	1028	132
Arrive On Green	0.05	0.14	0.14	0.05	0.14	0.14	0.12	0.35	0.32	0.08	0.32	0.29
Sat Flow, veh/h	1810	1125	657	1810	1200	594	1810	2901	681	1810	3217	413
Grp Volume(v), veh/h	70	0	179	67	0	145	161	405	399	115	375	380
Grp Sat Flow(s),veh/h/ln	1810	0	1782	1810	0	1793	1810	1805	1777	1810	1805	1826
Q Serve(g_s), s	1.6	0.0	4.1	1.6	0.0	3.2	3.7	8.0	8.1	2.7	7.6	7.7
Cycle Q Clear(g_c), s	1.6	0.0	4.1	1.6	0.0	3.2	3.7	8.0	8.1	2.7	7.6	7.7
Prop In Lane	1.00		0.37	1.00		0.33	1.00		0.38	1.00		0.23
Lane Grp Cap(c), veh/h	96	0	246	93	0	245	211	637	628	150	577	583
V/C Ratio(X)	0.73	0.00	0.73	0.72	0.00	0.59	0.76	0.64	0.64	0.77	0.65	0.65
Avail Cap(c_a), veh/h	466	0	1544	424	0	1512	805	1691	1666	721	1607	1625
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	17.6	19.9	0.0	17.3	18.3	11.5	11.8	19.2	12.5	12.6
Incr Delay (d2), s/veh	4.0	0.0	1.6	3.9	0.0	0.9	2.2	0.4	0.4	3.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.4	0.6	0.0	1.1	1.4	2.2	2.2	1.0	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.9	0.0	19.2	23.8	0.0	18.2	20.5	11.9	12.2	22.3	12.9	13.1
LnGrp LOS	C	A	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	249				212				965			
Approach Delay, s/veh	20.5				20.0				13.4			
Approach LOS	C				B				B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.5	19.1	6.2	9.9	9.0	17.6	6.3	9.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	7.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0				
Max Q Clear Time (g_c+14), s	14.0	10.1	3.6	6.1	5.7	9.7	3.6	5.2				
Green Ext Time (p_c), s	0.1	2.9	0.0	0.6	0.2	2.7	0.0	0.4				

### Intersection Summary











HCM 6th Ctrl Delay 15.1  
HCM 6th LOS B

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	0	13	39	0	249	16	630	15	53	534	170
Future Volume (veh/h)	104	0	13	39	0	249	16	630	15	53	534	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	1870	1870	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	113	0	-12	45	0	117	17	733	4	62	621	185
Peak Hour Factor	0.92	0.92	0.92	0.86	0.92	0.86	0.92	0.86	0.86	0.86	0.86	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	0	0	0	0	0
Cap, veh/h	182	0	238	71	0	153	61	1211	528	90	964	287
Arrive On Green	0.10	0.00	0.00	0.04	0.00	0.10	0.03	0.34	0.34	0.05	0.35	0.32
Sat Flow, veh/h	1781	1870	0	1810	0	1585	1781	3610	1574	1810	2742	816
Grp Volume(v), veh/h	113	-12	-12	45	0	117	17	733	4	62	408	398
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1810	0	1585	1781	1805	1574	1810	1805	1753
Q Serve(g_s), s	2.4	0.0	0.0	1.0	0.0	2.9	0.4	6.7	0.1	1.3	7.5	7.6
Cycle Q Clear(g_c), s	2.4	0.0	0.0	1.0	0.0	2.9	0.4	6.7	0.1	1.3	7.5	7.6
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	182	0	0	71	0	153	61	1211	528	90	634	616
V/C Ratio(X)	0.62	0.00	0.00	0.63	0.00	0.77	0.28	0.61	0.01	0.69	0.64	0.65
Avail Cap(c_a), veh/h	247	0	0	1550	0	1877	247	3684	1606	502	2092	2032
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.1	0.0	0.0	18.8	0.0	17.5	18.7	11.0	8.8	18.5	10.8	11.1
Incr Delay (d2), s/veh	3.4	0.0	0.0	3.4	0.0	3.0	2.5	0.2	0.0	3.4	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.4	0.0	0.9	0.2	1.8	0.0	0.5	2.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.5	0.0	0.0	22.2	0.0	20.5	21.2	11.2	8.8	22.0	11.2	11.5
LnGrp LOS	C	A	A	C	A	C	C	B	A	C	B	B
Approach Vol, veh/h	89			162			754			868		
Approach Delay, s/veh	26.0			21.0			11.4			12.1		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.0	17.3	5.6	10.8	5.4	17.9	8.1	8.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.5	4.5	5.3	4.5	* 4.5				
Max Green Setting (Gmax), s	1.0	39.2	34.0	18.0	5.0	44.7	5.0	* 47				
Max Q Clear Time (g_c+13.3), s	13.3	8.7	3.0	0.0	2.4	9.6	4.4	4.9				
Green Ext Time (p_c), s	0.0	3.1	0.0	0.0	0.0	3.0	0.0	0.4				

### Intersection Summary

HCM 6th Ctrl Delay	13.2
HCM 6th LOS	B

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	0	35	74	0	57	56	275	37	24	283	120
Future Volume (veh/h)	114	0	35	74	0	57	56	275	37	24	283	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	130	0	-20	84	0	7	64	312	34	27	322	125
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	369	181	153	450	0	153	106	1170	127	50	831	317
Arrive On Green	0.10	0.00	0.00	0.10	0.00	0.10	0.06	0.36	0.30	0.03	0.33	0.27
Sat Flow, veh/h	1431	1900	1610	1440	0	1610	1810	3286	355	1810	2556	973
Grp Volume(v), veh/h	130	0	-20	84	0	7	64	170	176	27	226	221
Grp Sat Flow(s), veh/h/ln	1431	1900	1610	1440	0	1610	1810	1805	1836	1810	1805	1725
Q Serve(g_s), s	0.9	0.0	0.0	1.3	0.0	0.1	0.8	1.5	1.6	0.3	2.2	2.4
Cycle Q Clear(g_c), s	2.2	0.0	0.0	1.3	0.0	0.1	0.8	1.5	1.6	0.3	2.2	2.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.19	1.00		0.56
Lane Grp Cap(c), veh/h	369	181	153	450	0	153	106	643	654	50	587	561
V/C Ratio(X)	0.35	0.00	-0.13	0.19	0.00	0.05	0.61	0.27	0.27	0.54	0.38	0.39
Avail Cap(c_a), veh/h	2967	3630	3077	3064	0	3077	2200	3841	3907	1179	2822	2696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.3	0.0	0.0	10.0	0.0	9.5	10.6	5.3	5.4	11.1	6.0	6.3
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	0.0	0.0	2.1	0.1	0.1	3.4	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.2	0.0	0.0	0.2	0.1	0.1	0.1	0.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.5	0.0	0.0	10.1	0.0	9.5	12.7	5.4	5.5	14.4	6.1	6.5
LnGrp LOS	B	A	A	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h	110			91			410			474		
Approach Delay, s/veh	13.6			10.0			6.5			6.8		
Approach LOS	B			B			A			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	12.2		6.2	5.3	11.5		6.2				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	47.7	47.7		44.0	28.0	34.7		44.0				
Max Q Clear Time (g_c+I), s	12.3	3.6		4.2	2.8	4.4		3.3				
Green Ext Time (p_c), s	0.0	1.1		0.1	0.1	1.8		0.2				

### Intersection Summary

HCM 6th Ctrl Delay	7.7
HCM 6th LOS	A

# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Existing Plus Phase 1 PM Peak Hour

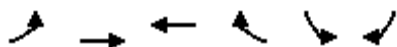


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑		↰	↑↑		↰	↑↑		↰	↑↑	
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	5	9	0	5	9	0	5	3184	0	5	3184	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3647	0	1781	3647	0	1781	3647	0
Grp Volume(v), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	0	1781	1777	0	1781	1777	0
Q Serve(g_s), 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
Cycle Q Clear(g_c), 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
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	5	9	0	5	9	0	5	3184	0	5	3184	0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	254	3184	0	254	3184	0	254	3184	0	254	3184	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h	0			0			0			0		
Approach Delay, s/veh	0.0			0.0			0.0			0.0		
Approach LOS												
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	0.0	38.5	0.0	0.0	0.0	38.5	0.0	0.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	34.0	5.0	34.0	5.0	34.0	5.0	34.0				
Max Q Clear Time (g_c+10), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	0.0											
HCM 6th LOS	A											

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

The Ranch  
Existing Plus Phase 1 PM Peak Hour

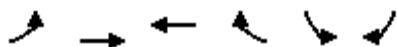


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	4	8	8	0	1625	1446
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	72944	0	1781	1585
Grp Volume(v), veh/h	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	0	1781	1585
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	4	8	8	0	1625	1446
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	1224	6205	3453	0	1625	1446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		0	0		0	
Approach Delay, s/veh		0.0	0.0		0.0	
Approach LOS						
Timer - Assigned Phs		4		6	7	8
Phs Duration (G+Y+Rc), s		0.0		45.7	0.0	0.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		79.3		41.2	30.9	43.9
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0	0.0
Green Ext Time (p_c), s		0.0		0.0	0.0	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			0.0			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	147	1311	0
Future Volume (veh/h)	0	0	0	147	1311	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	0	0	0	11	1425	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	318	132	132	111	2027	930
Arrive On Green	0.00	0.00	0.00	0.07	0.58	0.00
Sat Flow, veh/h	1426	1900	1900	1610	3510	1610
Grp Volume(v), veh/h	0	0	0	11	1425	0
Grp Sat Flow(s), veh/h/ln	1426	1900	1900	1610	1755	1610
Q Serve(g_s), s	0.0	0.0	0.0	0.1	6.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.1	6.5	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	318	132	132	111	2027	930
V/C Ratio(X)	0.00	0.00	0.00	0.10	0.70	0.00
Avail Cap(c_a), veh/h	1038	1091	1091	924	12246	5617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	9.9	3.4	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	10.0	3.6	0.0
LnGrp LOS	A	A	A	B	A	A
Approach Vol, veh/h		0	11		1425	
Approach Delay, s/veh		0.0	10.0		3.6	
Approach LOS			B		A	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		5.6			5.6	17.1
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		11.7			11.7	77.7
Max Q Clear Time (g_c+I1), s		0.0			2.1	8.5
Green Ext Time (p_c), s		0.0			0.0	3.2

### Intersection Summary

HCM 6th Ctrl Delay	3.6
HCM 6th LOS	A

### Notes








User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Existing Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1301	0	0	143	926	4	5	196	0	0	0
Future Volume (veh/h)	10	1301	0	0	143	926	4	5	196	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	11	1369	0	0	151	477	4	5	163			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	41	2810	0	0	738	1250	316	332	281			
Arrive On Green	0.01	0.54	0.00	0.00	0.39	0.39	0.17	0.17	0.17			
Sat Flow, veh/h	3510	5358	0	0	1900	3220	1810	1900	1610			
Grp Volume(v), veh/h	11	1369	0	0	151	477	4	5	163			
Grp Sat Flow(s),veh/h/ln	1755	1729	0	0	1900	1610	1810	1900	1610			
Q Serve(g_s), s	0.1	4.6	0.0	0.0	1.5	3.0	0.1	0.1	2.6			
Cycle Q Clear(g_c), s	0.1	4.6	0.0	0.0	1.5	3.0	0.1	0.1	2.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	41	2810	0	0	738	1250	316	332	281			
V/C Ratio(X)	0.27	0.49	0.00	0.00	0.20	0.38	0.01	0.02	0.58			
Avail Cap(c_a), veh/h	1992	13795	0	0	3706	6281	3016	3167	2684			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	13.8	4.0	0.0	0.0	5.7	6.2	9.6	9.6	10.7			
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0	0.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.1	4.1	0.0	0.0	5.8	6.3	9.6	9.6	11.4			
LnGrp LOS	B	A	A	A	A	A	A	A	B			
Approach Vol, veh/h	1380			628			172					
Approach Delay, s/veh	4.2			6.2			11.3					
Approach LOS	A			A			B					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	19.3			8.9		4.3	14.9					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	73.7			45.7		16.0	53.7					
Max Q Clear Time (g_c+I1), s	6.6			4.6		2.1	5.0					
Green Ext Time (p_c), s	7.3			0.3		0.0	1.5					




### Intersection Summary

HCM 6th Ctrl Delay	5.3
HCM 6th LOS	A

### Notes

User approved volume balancing among the lanes for turning movement.

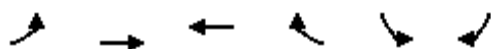


Intersection						
Int Delay, s/veh	11.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	434	45	35	366	35
Future Vol, veh/h	34	434	45	35	366	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	37	477	49	38	402	38
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	910	68	0	0	87	0
Stage 1	68	-	-	-	-	-
Stage 2	842	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	307	1001	-	-	1522	-
Stage 1	960	-	-	-	-	-
Stage 2	426	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	224	1001	-	-	1522	-
Mov Cap-2 Maneuver	224	-	-	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	311	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	17.2	0	7.5			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	800	1522	-	
HCM Lane V/C Ratio	-	-	0.643	0.264	-	
HCM Control Delay (s)	-	-	17.2	8.2	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	4.8	1.1	-	

# HCM 6th Signalized Intersection Summary

## 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Existing Plus Phase 1 PM Peak Hour



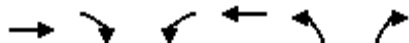
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↶↶	↶↶	↷	↷	↷↷	
Traffic Volume (veh/h)	102	1246	818	30	571	576	
Future Volume (veh/h)	102	1246	818	30	571	576	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	109	1326	870	0	607	589	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	179	1476	1169		917	1581	
Arrive On Green	0.05	0.42	0.33	0.00	0.51	0.51	
Sat Flow, veh/h	3456	3647	3647	1585	1781	2790	
Grp Volume(v), veh/h	109	1326	870	0	607	589	
Grp Sat Flow(s),veh/h/ln	1728	1777	1777	1585	1781	1395	
Q Serve(g_s), s	3.6	40.0	25.0	0.0	28.8	13.3	
Cycle Q Clear(g_c), s	3.6	40.0	25.0	0.0	28.8	13.3	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	179	1476	1169		917	1581	
V/C Ratio(X)	0.61	0.90	0.74		0.66	0.37	
Avail Cap(c_a), veh/h	361	1740	1245		917	1581	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	53.4	31.3	34.3	0.0	20.5	13.7	
Incr Delay (d2), s/veh	1.3	5.4	2.0	0.0	1.4	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.5	17.1	10.6	0.0	12.0	13.5	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	54.6	36.7	36.2	0.0	22.0	13.7	
LnGrp LOS	D	D	D		C	B	
Approach Vol, veh/h							
		1435	870	A	1196		
Approach Delay, s/veh							
		38.1	36.2		17.9		
Approach LOS							
		D	D		B		
Timer - Assigned Phs							
				4	6	7	8
Phs Duration (G+Y+Rc), s				51.8	63.2	9.9	41.8
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				55.8	50.2	11.5	39.8
Max Q Clear Time (g_c+I1), s				42.0	30.8	5.6	27.0
Green Ext Time (p_c), s				5.3	2.4	0.1	3.1
Intersection Summary							
HCM 6th Ctrl Delay			30.7				
HCM 6th LOS			C				

### Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Existing Plus Phase 1 PM Peak Hour

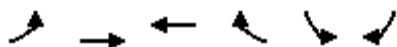







Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑	↘↘	↗
Traffic Volume (veh/h)	1320	498	0	1176	183	65
Future Volume (veh/h)	1320	498	0	1176	183	65
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1435	330	0	1278	199	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1820	812	0	1820	1446	663
Arrive On Green	0.51	0.51	0.00	0.51	0.42	0.42
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1435	330	0	1278	199	17
Grp Sat Flow(s),veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	38.0	14.8	0.0	31.5	4.1	0.7
Cycle Q Clear(g_c), s	38.0	14.8	0.0	31.5	4.1	0.7
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1820	812	0	1820	1446	663
V/C Ratio(X)	0.79	0.41	0.00	0.70	0.14	0.03
Avail Cap(c_a), veh/h	2565	1144	0	2565	1446	663
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.0	17.3	0.0	21.4	20.6	19.7
Incr Delay (d2), s/veh	1.1	0.3	0.0	0.5	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	5.4	0.0	12.1	1.7	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.1	17.6	0.0	21.9	20.8	19.7
LnGrp LOS	C	B	A	C	C	B
Approach Vol, veh/h	1765			1278	216	
Approach Delay, s/veh	22.9			21.9	20.7	
Approach LOS	C			C	C	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	52.1		62.9		62.9	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	23.5		82.5		82.5	
Max Q Clear Time (g_c+I1), s	6.1		40.0		33.5	
Green Ext Time (p_c), s	0.6		18.4		11.8	
Intersection Summary						
HCM 6th Ctrl Delay			22.3			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Prewett Ranch Drive & Hillcrest Avenue

The Ranch  
Existing Plus Phase 1 PM Peak Hour





















Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	174	43	31	4	7	153	
Future Volume (veh/h)	174	43	31	4	7	153	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	185	46	33	4	7	163	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	299	827	178	22	405	360	
Arrive On Green	0.17	0.44	0.11	0.09	0.23	0.23	
Sat Flow, veh/h	1781	1870	1636	198	1781	1585	
Grp Volume(v), veh/h	185	46	0	37	7	163	
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1835	1781	1585	
Q Serve(g_s), s	2.3	0.3	0.0	0.4	0.1	2.1	
Cycle Q Clear(g_c), s	2.3	0.3	0.0	0.4	0.1	2.1	
Prop In Lane	1.00			0.11	1.00	1.00	
Lane Grp Cap(c), veh/h	299	827	0	200	405	360	
V/C Ratio(X)	0.62	0.06	0.00	0.18	0.02	0.45	
Avail Cap(c_a), veh/h	405	2164	0	1403	1399	1245	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	9.4	3.9	0.0	9.8	7.3	8.1	
Incr Delay (d2), s/veh	2.1	0.0	0.0	0.4	0.0	0.9	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.1	0.0	2.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	11.4	3.9	0.0	10.3	7.3	8.9	
LnGrp LOS	B	A	A	B	A	A	
Approach Vol, veh/h							
		231	37	170			
Approach Delay, s/veh							
		9.9	10.3	8.9			
Approach LOS							
		A	B	A			
Timer - Assigned Phs							
				4	6	7	8
Phs Duration (G+Y+Rc), s				14.7	9.5	8.1	6.6
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				27.5	18.5	5.0	18.0
Max Q Clear Time (g_c+I1), s				2.3	4.1	4.3	2.4
Green Ext Time (p_c), s				0.2	0.4	0.0	0.1
Intersection Summary							
HCM 6th Ctrl Delay			9.6				
HCM 6th LOS			A				

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Existing Plus Phase 2 AM Peak Hour








												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	232	0	283	887	756	0	0	653	419
Future Volume (veh/h)	0	0	0	232	0	283	887	756	0	0	653	419
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				273	0	174	1044	889	0	0	768	140
Peak Hour Factor				0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %				1	0	1	2	2	0	0	2	2
Cap, veh/h				616	0	283	1232	2388	0	0	1545	377
Arrive On Green				0.18	0.00	0.18	0.36	0.67	0.00	0.00	0.24	0.24
Sat Flow, veh/h				3483	0	1598	3456	3647	0	0	6696	1572
Grp Volume(v), veh/h				273	0	174	1044	889	0	0	768	140
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1728	1777	0	0	1609	1572
Q Serve(g_s), s				3.7	0.0	5.3	14.7	5.8	0.0	0.0	5.5	3.9
Cycle Q Clear(g_c), s				3.7	0.0	5.3	14.7	5.8	0.0	0.0	5.5	3.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				616	0	283	1232	2388	0	0	1545	377
V/C Ratio(X)				0.44	0.00	0.62	0.85	0.37	0.00	0.00	0.50	0.37
Avail Cap(c_a), veh/h				2829	0	1298	2937	5974	0	0	4861	1188
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				19.5	0.0	20.1	15.7	3.8	0.0	0.0	17.4	16.8
Incr Delay (d2), s/veh				0.2	0.0	0.8	0.6	0.0	0.0	0.0	0.1	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.3	0.0	1.7	4.5	0.8	0.0	0.0	1.7	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				19.6	0.0	20.9	16.4	3.8	0.0	0.0	17.5	17.0
LnGrp LOS				B	A	C	B	A	A	A	B	B
Approach Vol, veh/h					447			1933			908	
Approach Delay, s/veh					20.1			10.6			17.4	
Approach LOS					C			B			B	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	39.6			22.9			16.7			13.4		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	7.8			16.7			7.5			7.3		
Green Ext Time (p_c), s	4.1			2.1			3.6			0.7		
Intersection Summary												
HCM 6th Ctrl Delay	13.8											
HCM 6th LOS	B											

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	349	0	515	0	0	0	0	1295	190	276	608	0
Future Volume (veh/h)	349	0	515	0	0	0	0	1295	190	276	608	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1885	1885	1870	1870	0
Adj Flow Rate, veh/h	406	0	599				0	1506	200	321	707	0
Peak Hour Factor	0.86	0.86	0.86				0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3				0	1	1	2	2	0
Cap, veh/h	986	0	877				0	2330	309	442	2028	0
Arrive On Green	0.28	0.00	0.28				0.00	0.40	0.38	0.13	0.57	0.00
Sat Flow, veh/h	3534	0	3145				0	6098	774	3456	3647	0
Grp Volume(v), veh/h	406	0	599				0	1255	451	321	707	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1621	1744	1728	1777	0
Q Serve(g_s), s	5.8	0.0	10.5				0.0	12.9	13.0	5.5	6.6	0.0
Cycle Q Clear(g_c), s	5.8	0.0	10.5				0.0	12.9	13.0	5.5	6.6	0.0
Prop In Lane	1.00		1.00				0.00		0.44	1.00		0.00
Lane Grp Cap(c), veh/h	986	0	877				0	1942	697	442	2028	0
V/C Ratio(X)	0.41	0.00	0.68				0.00	0.65	0.65	0.73	0.35	0.00
Avail Cap(c_a), veh/h	3942	0	3508				0	3302	1184	950	3619	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.2	0.0	19.9				0.0	15.0	15.3	25.9	7.1	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.9				0.0	0.1	0.4	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	3.4				0.0	3.8	4.3	2.1	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.5	0.0	20.8				0.0	15.2	15.7	26.8	7.2	0.0
LnGrp LOS	B	A	C				A	B	B	C	A	A
Approach Vol, veh/h	1005						1706			1028		
Approach Delay, s/veh	19.9						15.3			13.3		
Approach LOS	B						B			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), \$1.9	28.7	21.3		40.6								
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	7.0	40.7	68.5		* 63							
Max Q Clear Time (g_c+I1), s	17.5	15.0	12.5		8.6							
Green Ext Time (p_c), s	0.4	8.4	4.3		3.0							

### Intersection Summary

HCM 6th Ctrl Delay	16.0
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.















\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Existing Plus Phase 2 AM Peak Hour

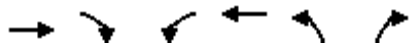


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	 		 	
Traffic Volume (veh/h)	23	2	81	425	79	104	231	462	900	26	593	31
Future Volume (veh/h)	23	2	81	425	79	104	231	462	900	26	593	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1841	1841	1841	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	27	2	0	500	93	66	272	544	373	31	698	31
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	8	8	4	4	4	2	2	2	5	5	5
Cap, veh/h	42	172	0	702	214	152	328	1424	1100	125	976	43
Arrive On Green	0.02	0.10	0.00	0.14	0.21	0.20	0.18	0.40	0.40	0.07	0.29	0.27
Sat Flow, veh/h	1697	1781	0	4944	1002	711	1781	3554	2745	1739	3383	150
Grp Volume(v), veh/h	27	2	0	500	0	159	272	544	373	31	358	371
Grp Sat Flow(s),veh/h/ln	1697	1781	0	1648	0	1713	1781	1777	1372	1739	1735	1799
Q Serve(g_s), s	0.9	0.1	0.0	5.4	0.0	4.5	8.1	6.0	5.2	0.9	10.2	10.3
Cycle Q Clear(g_c), s	0.9	0.1	0.0	5.4	0.0	4.5	8.1	6.0	5.2	0.9	10.2	10.3
Prop In Lane	1.00		0.00	1.00		0.42	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	42	172	0	702	0	366	328	1424	1100	125	501	519
V/C Ratio(X)	0.65	0.01	0.00	0.71	0.00	0.43	0.83	0.38	0.34	0.25	0.71	0.72
Avail Cap(c_a), veh/h	153	954	0	1070	0	1134	546	3096	2392	125	1105	1145
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.8	22.7	0.0	22.7	0.0	19.0	21.8	11.8	11.5	24.3	17.7	17.7
Incr Delay (d2), s/veh	6.2	0.0	0.0	0.5	0.0	0.3	2.1	0.1	0.1	0.4	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.8	0.0	1.5	3.1	1.8	1.2	0.4	3.4	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	22.7	0.0	23.2	0.0	19.3	23.8	11.8	11.6	24.7	18.4	18.4
LnGrp LOS	C	C	A	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	29		659			1189			760			
Approach Delay, s/veh	32.2		22.3			14.5			18.7			
Approach LOS	C		C			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	26.2	11.9	9.4	14.2	20.0	5.4	15.9				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	47.4	12.0	29.1	17.0	34.4	5.0	36.1				
Max Q Clear Time (g_c+I2), s	8.0	8.0	7.4	2.1	10.1	12.3	2.9	6.5				
Green Ext Time (p_c), s	0.0	3.1	0.5	0.0	0.2	2.5	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay			17.8									
HCM 6th LOS			B									

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	234	694	55	283	325	160
Future Volume (veh/h)	234	694	55	283	325	160
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1366	1366	1856	1856
Adj Flow Rate, veh/h	252	228	59	304	349	34
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	36	36	3	3
Cap, veh/h	1034	455	214	716	617	283
Arrive On Green	0.29	0.29	0.08	0.52	0.18	0.18
Sat Flow, veh/h	3647	1566	2525	1366	3428	1572
Grp Volume(v), veh/h	252	228	59	304	349	34
Grp Sat Flow(s), veh/h/ln	1777	1566	1262	1366	1714	1572
Q Serve(g_s), s	1.5	3.3	0.6	3.7	2.5	0.5
Cycle Q Clear(g_c), s	1.5	3.3	0.6	3.7	2.5	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1034	455	214	716	617	283
V/C Ratio(X)	0.24	0.50	0.28	0.42	0.57	0.12
Avail Cap(c_a), veh/h	7109	3133	524	3219	2337	1072
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.3	7.9	11.6	3.9	10.1	9.3
Incr Delay (d2), s/veh	0.0	0.3	0.7	0.1	0.3	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.2	0.5	0.1	0.0	0.7	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	7.4	8.3	12.3	4.1	10.4	9.3
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	480			363	383	
Approach Delay, s/veh	7.8			5.4	10.3	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		8.9	6.3	11.9		18.1
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		18.4	5.1	53.4		63.0
Max Q Clear Time (g_c+I1), s		4.5	2.6	5.3		5.7
Green Ext Time (p_c), s		0.6	0.0	1.3		1.1
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			7.9			
HCM 6th LOS			A			









# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Traffic Volume (veh/h)	173	0	828	0	0	0	0	1420	359	158	669	0
Future Volume (veh/h)	173	0	828	0	0	0	0	1420	359	158	669	0
Initial Q (Qb), veh	0	0	60				0	60	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00					1.00	0.97		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No				No	
Adj Sat Flow, veh/h/ln	1870	0	1870				0	1870	1870	1826	1826	0
Adj Flow Rate, veh/h	197	0	290				0	1614	373	180	760	0
Peak Hour Factor	0.88	0.88	0.88				0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	0	2				0	2	2	5	5	0
Cap, veh/h	530	0	588				0	2457	479	268	3654	0
Arrive On Green	0.14	0.00	0.14				0.00	0.55	0.54	0.08	0.72	0.00
Sat Flow, veh/h	3456	0	3614				0	4837	945	3374	5149	0
Grp Volume(v), veh/h	197	0	290				0	1329	658	180	760	0
Grp Sat Flow(s),veh/h/ln	1728	0	1205				0	1122	1667	1687	1662	0
Q Serve(g_s), s	3.1	0.0	4.4				0.0	17.2	17.3	3.0	3.0	0.0
Cycle Q Clear(g_c), s	3.1	0.0	4.4				0.0	17.2	17.3	3.0	3.0	0.0
Prop In Lane	1.00	1.00					0.00	0.57		1.00	0.00	
Lane Grp Cap(c), veh/h	530	0	588				0	1925	951	268	3654	0
V/C Ratio(X)	0.37	0.00	0.49				0.00	0.69	0.69	0.67	0.21	0.00
Avail Cap(c_a), veh/h	1055	0	1103				0	3881	1922	686	3972	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.7	0.0	39.1				0.0	11.8	11.1	34.3	3.1	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.2				0.0	0.2	0.3	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	147.8				0.0	12.7	5.8	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	12.2				0.0	7.6	8.1	1.6	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.9	0.0	187.1				0.0	24.7	17.2	35.4	3.1	0.0
LnGrp LOS	C	A	F				A	C	B	D	A	A
Approach Vol, veh/h	487						1987				940	
Approach Delay, s/veh	123.1						22.2				9.3	
Approach LOS	F						C				A	
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	9.8	36.6	12.5		46.5							
Change Period (Y+Rc), s	4.9	* 4.9	5.3		4.9							
Max Green Setting (Gmax), s	2.0	* 67	16.7		46.1							
Max Q Clear Time (g_c+I), s	15.0	19.3	6.4		5.0							
Green Ext Time (p_c), s	0.2	12.4	0.8		3.4							

### Intersection Summary

HCM 6th Ctrl Delay	33.0
HCM 6th LOS	C

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Existing Plus Phase 2 AM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↱	↰	↱		↰	↱	↱
Traffic Volume (veh/h)	27	22	20	182	32	233	21	1141	111	159	771	20
Future Volume (veh/h)	27	22	20	182	32	233	21	1141	111	159	771	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	25	0	207	36	14	24	1297	123	181	876	22
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	1	1	1	2	2	2	2	2	2
Cap, veh/h	62	50	98	278	292	247	38	1564	148	276	1895	48
Arrive On Green	0.06	0.06	0.00	0.15	0.15	0.15	0.02	0.48	0.47	0.08	0.54	0.53
Sat Flow, veh/h	1000	806	1572	1795	1885	1595	1781	3280	310	3456	3540	89
Grp Volume(v), veh/h	56	0	0	207	36	14	24	700	720	181	440	458
Grp Sat Flow(s), veh/h/ln	1806	0	1572	1795	1885	1595	1781	1777	1813	1728	1777	1852
Q Serve(g_s), s	2.1	0.0	0.0	7.8	1.2	0.5	0.9	24.1	24.4	3.6	10.8	10.8
Cycle Q Clear(g_c), s	2.1	0.0	0.0	7.8	1.2	0.5	0.9	24.1	24.4	3.6	10.8	10.8
Prop In Lane	0.55		1.00	1.00		1.00	1.00		0.17	1.00		0.05
Lane Grp Cap(c), veh/h	113	0	98	278	292	247	38	847	864	276	951	992
V/C Ratio(X)	0.50	0.00	0.00	0.74	0.12	0.06	0.63	0.83	0.83	0.66	0.46	0.46
Avail Cap(c_a), veh/h	893	0	778	964	1012	856	403	1883	1921	781	1883	1962
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	0.0	0.0	28.6	25.8	25.5	34.4	16.0	16.1	31.6	10.2	10.2
Incr Delay (d2), s/veh	1.3	0.0	0.0	1.5	0.1	0.0	6.4	0.8	0.8	1.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	3.2	0.5	0.2	0.4	8.0	8.3	1.5	3.7	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.4	0.0	0.0	30.1	25.8	25.5	40.7	16.8	16.9	32.6	10.3	10.3
LnGrp LOS	C	A	A	C	C	C	D	B	B	C	B	B
Approach Vol, veh/h	56			257			1444			1079		
Approach Delay, s/veh	33.4			29.2			17.3			14.0		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.7	37.7		8.4	5.5	41.9		15.0				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+1), s	15.6	26.4		4.1	2.9	12.8		9.8				
Green Ext Time (p_c), s	0.2	6.8		0.1	0.0	4.2		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	17.4											
HCM 6th LOS	B											

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	117	70	39	127	621	64	662	13	448	856	125
Future Volume (veh/h)	142	117	70	39	127	621	64	662	13	448	856	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	160	131	18	44	143	698	72	744	14	503	962	70
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	2	2	2
Cap, veh/h	199	985	133	57	440	1290	137	973	18	615	1263	713
Arrive On Green	0.11	0.31	0.31	0.03	0.23	0.23	0.08	0.27	0.25	0.18	0.36	0.34
Sat Flow, veh/h	1781	3139	423	1795	1885	3195	1795	3595	68	3456	3554	1582
Grp Volume(v), veh/h	160	73	76	44	143	698	72	371	387	503	962	70
Grp Sat Flow(s),veh/h/ln	1781	1777	1785	1795	1885	1598	1795	1791	1872	1728	1777	1582
Q Serve(g_s), s	6.8	2.3	2.4	1.9	4.9	12.9	3.0	14.8	14.8	10.9	18.6	1.0
Cycle Q Clear(g_c), s	6.8	2.3	2.4	1.9	4.9	12.9	3.0	14.8	14.8	10.9	18.6	1.0
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	199	557	560	57	440	1290	137	485	507	615	1263	713
V/C Ratio(X)	0.80	0.13	0.14	0.78	0.32	0.54	0.52	0.76	0.76	0.82	0.76	0.10
Avail Cap(c_a), veh/h	528	1694	1702	231	1481	3055	254	1107	1157	1424	3158	1557
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	19.1	19.1	37.3	24.7	17.7	34.5	26.0	26.1	30.7	22.1	4.1
Incr Delay (d2), s/veh	2.9	0.0	0.0	8.2	0.2	0.1	1.2	1.0	0.9	1.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.9	0.9	0.9	2.0	4.2	1.3	5.8	6.1	4.5	7.3	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.5	19.1	19.2	45.5	24.8	17.8	35.7	27.0	27.0	31.7	22.5	4.2
LnGrp LOS	D	B	B	D	C	B	D	C	C	C	C	A
Approach Vol, veh/h	309				885		830				1535	
Approach Delay, s/veh	28.1				20.3		27.7				24.7	
Approach LOS	C				C		C				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.8	25.0	6.5	28.4	11.2	31.6	12.7	22.1				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	32.0	46.7	10.0	73.4	11.0	* 68	23.0	60.4				
Max Q Clear Time (g_c+11.2), s	12.9	16.8	3.9	4.4	5.0	20.6	8.8	14.9				
Green Ext Time (p_c), s	0.9	2.7	0.0	0.5	0.0	5.6	0.2	2.1				

### Intersection Summary

HCM 6th Ctrl Delay 24.6

HCM 6th LOS C

### Notes

User approved volume balancing among the lanes for turning movement.












\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	59	577	7	95	55	749	1129	13	66	711	145
Future Volume (veh/h)	159	59	577	7	95	55	749	1129	13	66	711	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	110	131	78	7	96	8	757	1140	6	67	718	126
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	2	2	2
Cap, veh/h	215	226	383	11	151	134	904	1759	767	85	1171	203
Arrive On Green	0.12	0.12	0.12	0.09	0.09	0.09	0.26	0.49	0.49	0.05	0.27	0.26
Sat Flow, veh/h	1795	1885	3195	127	1737	1551	3483	3582	1561	1781	4363	757
Grp Volume(v), veh/h	110	131	78	103	0	8	757	1140	6	67	558	286
Grp Sat Flow(s),veh/h/ln	1795	1885	1598	1864	0	1551	1742	1791	1561	1781	1702	1715
Q Serve(g_s), s	3.6	4.1	1.4	3.4	0.0	0.3	12.9	14.9	0.1	2.3	9.0	9.2
Cycle Q Clear(g_c), s	3.6	4.1	1.4	3.4	0.0	0.3	12.9	14.9	0.1	2.3	9.0	9.2
Prop In Lane	1.00		1.00	0.07		1.00	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	215	226	383	162	0	134	904	1759	767	85	913	460
V/C Ratio(X)	0.51	0.58	0.20	0.64	0.00	0.06	0.84	0.65	0.01	0.78	0.61	0.62
Avail Cap(c_a), veh/h	514	540	915	1157	0	962	1829	3191	1391	312	1841	928
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9	26.2	25.0	27.7	0.0	26.4	22.0	11.9	8.2	29.6	20.1	20.3
Incr Delay (d2), s/veh	0.7	0.9	0.1	1.6	0.0	0.1	0.8	0.2	0.0	5.8	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.7	0.5	1.4	0.0	0.1	4.6	4.5	0.0	1.1	3.3	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.6	27.0	25.1	29.3	0.0	26.4	22.8	12.1	8.2	35.4	20.4	20.8
LnGrp LOS	C	C	C	C	A	C	C	B	A	D	C	C
Approach Vol, veh/h	319				111		1903				911	
Approach Delay, s/veh	26.4				29.1		16.4				21.6	
Approach LOS	C				C		B				C	
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	7.0	34.9	11.5		20.3	21.6	9.4					
Change Period (Y+Rc), s	4.0	5.3	4.9		4.0	* 5.3	4.0					
Max Green Setting (Gmax),s	1.0	54.7	17.1		33.0	* 33	39.0					
Max Q Clear Time (g_c+14.3)	14.3	16.9	6.1		14.9	11.2	5.4					
Green Ext Time (p_c), s	0.0	5.6	0.5		1.4	3.9	0.3					

### Intersection Summary

HCM 6th Ctrl Delay 19.3

HCM 6th LOS B

### Notes

User approved volume balancing among the lanes for turning movement.













\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	736	192	185	1013	69	327	139	173	62	173	111
Future Volume (veh/h)	46	736	192	185	1013	69	327	139	173	62	173	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	53	846	105	213	1164	24	376	160	50	71	199	108
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	68	1025	449	249	1387	604	457	665	550	92	311	169
Arrive On Green	0.04	0.29	0.29	0.14	0.39	0.39	0.13	0.35	0.35	0.05	0.27	0.26
Sat Flow, veh/h	1795	3582	1571	1795	3582	1561	3483	1885	1559	1810	1141	619
Grp Volume(v), veh/h	53	846	105	213	1164	24	376	160	50	71	0	307
Grp Sat Flow(s),veh/h/ln	1795	1791	1571	1795	1791	1561	1742	1885	1559	1810	0	1760
Q Serve(g_s), s	2.7	20.6	4.8	10.8	27.6	0.9	9.8	5.6	2.0	3.6	0.0	14.4
Cycle Q Clear(g_c), s	2.7	20.6	4.8	10.8	27.6	0.9	9.8	5.6	2.0	3.6	0.0	14.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	68	1025	449	249	1387	604	457	665	550	92	0	480
V/C Ratio(X)	0.78	0.83	0.23	0.85	0.84	0.04	0.82	0.24	0.09	0.77	0.00	0.64
Avail Cap(c_a), veh/h	173	1587	696	461	2162	942	708	960	794	213	0	746
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.6	31.2	25.5	39.3	26.0	17.8	39.5	21.4	20.2	43.8	0.0	30.2
Incr Delay (d2), s/veh	6.9	1.2	0.1	3.2	1.0	0.0	2.4	0.1	0.0	5.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	8.4	1.7	4.8	10.8	0.3	4.1	2.3	0.7	1.7	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.5	32.3	25.6	42.5	27.0	17.8	42.0	21.5	20.2	48.9	0.0	30.7
LnGrp LOS	D	C	C	D	C	B	D	C	C	D	A	C
Approach Vol, veh/h	1004		1401			586			378			
Approach Delay, s/veh	32.6		29.2			34.5			34.1			
Approach LOS	C		C			C			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.8	37.0	17.0	30.7	16.3	29.5	7.5	40.2				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	1.0	46.3	24.0	* 41	19.0	38.3	9.0	* 56				
Max Q Clear Time (g_c+15.6)	1.0	7.6	12.8	22.6	11.8	16.4	4.7	29.6				
Green Ext Time (p_c), s	0.0	0.6	0.2	3.6	0.4	1.0	0.0	5.6				

### Intersection Summary

HCM 6th Ctrl Delay	31.7
HCM 6th LOS	C

### Notes











\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	615	280	241	644	215	435	304	160	297	541	20
Future Volume (veh/h)	27	615	280	241	644	215	435	304	160	297	541	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	31	715	73	280	749	86	506	353	95	345	629	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	39	986	416	309	1517	667	561	816	216	411	883	29
Arrive On Green	0.02	0.28	0.28	0.17	0.43	0.43	0.16	0.29	0.28	0.12	0.25	0.24
Sat Flow, veh/h	1795	3582	1513	1781	3554	1563	3483	2785	738	3483	3532	118
Grp Volume(v), veh/h	31	715	73	280	749	86	506	225	223	345	319	331
Grp Sat Flow(s),veh/h/ln	1795	1791	1513	1781	1777	1563	1742	1791	1732	1742	1791	1859
Q Serve(g_s), s	2.0	20.7	4.2	17.6	17.5	3.8	16.3	11.6	12.0	11.1	18.5	18.6
Cycle Q Clear(g_c), s	2.0	20.7	4.2	17.6	17.5	3.8	16.3	11.6	12.0	11.1	18.5	18.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.43	1.00		0.06
Lane Grp Cap(c), veh/h	39	986	416	309	1517	667	561	525	508	411	448	465
V/C Ratio(X)	0.79	0.73	0.18	0.90	0.49	0.13	0.90	0.43	0.44	0.84	0.71	0.71
Avail Cap(c_a), veh/h	94	1192	503	421	1835	807	579	611	591	610	627	651
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.6	37.5	31.5	46.3	23.8	19.8	47.0	32.6	33.0	49.3	39.1	39.1
Incr Delay (d2), s/veh	12.1	1.3	0.1	15.6	0.1	0.0	16.5	0.2	0.2	4.4	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	8.9	1.5	8.9	6.9	1.3	8.1	4.9	4.9	4.9	8.0	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.7	38.8	31.6	61.8	23.9	19.9	63.6	32.8	33.2	53.7	40.0	40.0
LnGrp LOS	E	D	C	E	C	B	E	C	C	D	D	D
Approach Vol, veh/h	819			1115			954			995		
Approach Delay, s/veh	39.2			33.1			49.2			44.8		
Approach LOS	D			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.5	37.5	23.8	35.4	22.4	32.6	6.5	52.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+11.3, s)	13.5	14.0	19.6	22.7	18.3	20.6	4.0	19.5				
Green Ext Time (p_c), s	0.4	1.5	0.2	2.7	0.1	2.1	0.0	3.4				

### Intersection Summary













HCM 6th Ctrl Delay 41.3  
HCM 6th LOS D

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	574	7	32	848	146	36	61	26	310	79	194
Future Volume (veh/h)	154	574	7	32	848	146	36	61	26	310	79	194
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	173	645	2	36	953	42	40	69	8	348	89	67
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	204	1448	637	55	1655	511	60	396	45	465	796	348
Arrive On Green	0.11	0.41	0.41	0.03	0.32	0.32	0.03	0.12	0.10	0.13	0.22	0.22
Sat Flow, veh/h	1781	3554	1562	1781	5106	1578	1795	3239	369	3483	3582	1567
Grp Volume(v), veh/h	173	645	2	36	953	42	40	38	39	348	89	67
Grp Sat Flow(s),veh/h/ln	1781	1777	1562	1781	1702	1578	1795	1791	1817	1742	1791	1567
Q Serve(g_s), s	5.0	6.9	0.0	1.0	8.1	1.0	1.2	1.0	1.0	5.0	1.0	1.8
Cycle Q Clear(g_c), s	5.0	6.9	0.0	1.0	8.1	1.0	1.2	1.0	1.0	5.0	1.0	1.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.20	1.00		1.00
Lane Grp Cap(c), veh/h	204	1448	637	55	1655	511	60	219	222	465	796	348
V/C Ratio(X)	0.85	0.45	0.00	0.65	0.58	0.08	0.66	0.17	0.18	0.75	0.11	0.19
Avail Cap(c_a), veh/h	204	3141	1380	204	4513	1394	206	1528	1551	465	3125	1367
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.7	11.2	9.2	25.1	14.7	12.3	25.0	20.6	20.7	21.9	16.3	16.6
Incr Delay (d2), s/veh	25.8	0.1	0.0	4.7	0.1	0.0	4.5	0.1	0.1	5.9	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	2.0	0.0	0.5	2.5	0.3	0.5	0.4	0.4	2.1	0.4	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.5	11.3	9.2	29.8	14.8	12.3	29.5	20.7	20.9	27.7	16.3	16.7
LnGrp LOS	D	B	A	C	B	B	C	C	C	C	B	B
Approach Vol, veh/h	820			1031			117			504		
Approach Delay, s/veh	19.2			15.2			23.8			24.2		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.4	5.6	25.4	5.8	15.6	10.0	21.0					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	6.0	45.0	6.0	44.4	6.0	45.0					
Max Q Clear Time (g_c+11), s	3.0	3.0	8.9	3.2	3.8	7.0	10.1					
Green Ext Time (p_c), s	0.0	0.2	0.0	2.7	0.0	0.4	0.0	4.5				

### Intersection Summary

HCM 6th Ctrl Delay	18.8
HCM 6th LOS	B



# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1013	490	111	1236	0	0	0	0	350	2	568
Future Volume (veh/h)	0	1013	490	111	1236	0	0	0	0	350	2	568
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1101	132	121	1343	0				381	0	588
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	1	1	0				2	2	2
Cap, veh/h	0	1639	508	162	2370	0				1493	0	664
Arrive On Green	0.00	0.32	0.32	0.08	0.46	0.00				0.42	0.00	0.42
Sat Flow, veh/h	0	5316	1596	1975	5316	0				3563	0	1585
Grp Volume(v), veh/h	0	1101	132	121	1343	0				381	0	588
Grp Sat Flow(s),veh/h/ln	0	1716	1596	987	1716	0				1781	0	1585
Q Serve(g_s), s	0.0	12.3	4.1	4.0	12.7	0.0				4.6	0.0	22.8
Cycle Q Clear(g_c), s	0.0	12.3	4.1	4.0	12.7	0.0				4.6	0.0	22.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1639	508	162	2370	0				1493	0	664
V/C Ratio(X)	0.00	0.67	0.26	0.75	0.57	0.00				0.26	0.00	0.88
Avail Cap(c_a), veh/h	0	3557	1103	475	5104	0				3533	0	1572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.7	16.8	29.9	13.1	0.0				12.6	0.0	17.8
Incr Delay (d2), s/veh	0.0	0.2	0.1	2.6	0.1	0.0				0.0	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.2	1.3	0.9	3.9	0.0				1.5	0.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.8	16.9	32.5	13.2	0.0				12.6	0.0	19.5
LnGrp LOS	A	B	B	C	B	A				B	A	B
Approach Vol, veh/h		1233			1464						969	
Approach Delay, s/veh		19.5			14.8						16.8	
Approach LOS		B			B						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	9.5	25.2		31.9		34.7						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	60.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+10), s	10.0	14.3		24.8		14.7						
Green Ext Time (p_c), s	0.1	5.4		1.8		7.1						

### Intersection Summary

HCM 6th Ctrl Delay 16.9  
HCM 6th LOS B

### Notes

User approved volume balancing among the lanes for turning movement.



# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1009	354	36	832	451	515	24	176	0	0	0
Future Volume (veh/h)	0	1009	354	36	832	451	515	24	176	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	0	1097	125	39	904	229	579	0	51			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2			
Cap, veh/h	0	2076	644	63	2765	834	923	0	410			
Arrive On Green	0.00	0.41	0.41	0.04	0.54	0.54	0.26	0.00	0.26			
Sat Flow, veh/h	0	5274	1583	1781	5106	1541	3563	0	1583			
Grp Volume(v), veh/h	0	1097	125	39	904	229	579	0	51			
Grp Sat Flow(s),veh/h/ln	0	1702	1583	1781	1702	1541	1781	0	1583			
Q Serve(g_s), s	0.0	6.5	2.0	0.9	4.0	3.2	5.8	0.0	1.0			
Cycle Q Clear(g_c), s	0.0	6.5	2.0	0.9	4.0	3.2	5.8	0.0	1.0			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2076	644	63	2765	834	923	0	410			
V/C Ratio(X)	0.00	0.53	0.19	0.62	0.33	0.27	0.63	0.00	0.12			
Avail Cap(c_a), veh/h	0	6107	1893	488	8016	2419	4350	0	1933			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	9.0	7.7	19.1	5.1	5.0	13.1	0.0	11.4			
Incr Delay (d2), s/veh	0.0	0.1	0.1	3.7	0.0	0.1	0.3	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	1.4	0.4	0.4	0.6	0.4	1.7	0.0	0.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	9.1	7.7	22.8	5.2	5.0	13.4	0.0	11.4			
LnGrp LOS	A	A	A	C	A	A	B	A	B			
Approach Vol, veh/h		1222			1172			630				
Approach Delay, s/veh		8.9			5.7			13.3				
Approach LOS		A			A			B				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.4	20.3		14.4		25.7						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	1.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+I), s	12.5	8.5		7.8		6.0						
Green Ext Time (p_c), s	0.0	5.5		1.1		4.6						

### Intersection Summary

HCM 6th Ctrl Delay	8.6
HCM 6th LOS	A

### Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	86	5	8	58	343	5	131	11	242	96	22
Future Volume (veh/h)	39	86	5	8	58	343	5	131	11	242	96	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.95	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	46	102	4	10	69	229	6	156	6	288	114	18
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	136	469	18	135	97	321	137	554	21	354	864	133
Arrive On Green	0.08	0.26	0.26	0.08	0.26	0.26	0.08	0.16	0.13	0.20	0.28	0.25
Sat Flow, veh/h	1781	1786	70	1767	369	1224	1795	3510	134	1795	3101	479
Grp Volume(v), veh/h	46	0	106	10	0	298	6	79	83	288	65	67
Grp Sat Flow(s),veh/h/ln	1781	0	1856	1767	0	1593	1795	1791	1853	1795	1791	1789
Q Serve(g_s), s	1.3	0.0	2.3	0.3	0.0	8.9	0.2	2.0	2.1	8.0	1.4	1.5
Cycle Q Clear(g_c), s	1.3	0.0	2.3	0.3	0.0	8.9	0.2	2.0	2.1	8.0	1.4	1.5
Prop In Lane	1.00		0.04	1.00		0.77	1.00		0.07	1.00		0.27
Lane Grp Cap(c), veh/h	136	0	487	135	0	418	137	283	293	354	499	499
V/C Ratio(X)	0.34	0.00	0.22	0.07	0.00	0.71	0.04	0.28	0.28	0.81	0.13	0.13
Avail Cap(c_a), veh/h	375	0	1278	372	0	1096	721	1746	1807	721	1746	1744
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.9	0.0	15.1	22.4	0.0	17.5	22.4	19.4	19.5	20.1	14.1	14.3
Incr Delay (d2), s/veh	0.5	0.0	0.1	0.1	0.0	0.9	0.0	0.2	0.2	1.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.8	0.1	0.0	2.7	0.1	0.7	0.8	2.9	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.4	0.0	15.2	22.5	0.0	18.4	22.4	19.6	19.7	21.8	14.2	14.3
LnGrp LOS	C	A	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	152					308		168		420		
Approach Delay, s/veh	17.7					18.5		19.7		19.4		
Approach LOS	B					B		B		B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.3	12.3	8.0	17.7	8.0	18.6	8.0	17.7				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	4.0	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+I10), s	4.1	4.1	2.3	4.3	2.2	3.5	3.3	10.9				
Green Ext Time (p_c), s	0.3	0.5	0.0	0.3	0.0	0.4	0.0	1.1				

## Intersection Summary









HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Existing Plus Phase 2 AM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	173	182	224	162	125	127	707	131	84	916	59
Future Volume (veh/h)	118	173	182	224	162	125	127	707	131	84	916	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	130	190	165	246	178	111	140	777	133	92	1007	61
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	162	215	187	281	321	200	171	1142	195	118	1178	71
Arrive On Green	0.09	0.23	0.23	0.16	0.30	0.30	0.10	0.37	0.36	0.07	0.34	0.33
Sat Flow, veh/h	1795	924	802	1781	1068	666	1795	3056	523	1795	3425	207
Grp Volume(v), veh/h	130	0	355	246	0	289	140	455	455	92	527	541
Grp Sat Flow(s),veh/h/ln	1795	0	1726	1781	0	1734	1795	1791	1788	1795	1791	1841
Q Serve(g_s), s	6.7	0.0	18.7	12.7	0.0	13.1	7.2	20.1	20.1	4.7	25.7	25.7
Cycle Q Clear(g_c), s	6.7	0.0	18.7	12.7	0.0	13.1	7.2	20.1	20.1	4.7	25.7	25.7
Prop In Lane	1.00		0.46	1.00		0.38	1.00		0.29	1.00		0.11
Lane Grp Cap(c), veh/h	162	0	402	281	0	521	171	669	668	118	616	633
V/C Ratio(X)	0.80	0.00	0.88	0.88	0.00	0.55	0.82	0.68	0.68	0.78	0.85	0.86
Avail Cap(c_a), veh/h	287	0	624	379	0	720	172	724	723	229	781	803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	0.0	34.8	38.7	0.0	27.6	41.7	24.7	24.9	43.2	28.7	28.7
Incr Delay (d2), s/veh	3.5	0.0	6.2	13.0	0.0	0.3	24.1	1.8	1.8	4.2	6.3	6.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	8.1	6.3	0.0	5.1	4.2	8.1	8.2	2.2	11.2	11.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.5	0.0	41.0	51.6	0.0	27.9	65.8	26.5	26.7	47.4	34.9	34.9
LnGrp LOS	D	A	D	D	A	C	E	C	C	D	C	C
Approach Vol, veh/h	485		535			1050			1160			
Approach Delay, s/veh	42.2		38.8			31.8			35.9			
Approach LOS	D		D			C			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	39.1	18.8	25.9	13.0	36.3	12.5	32.3					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	36.7	20.0	34.0	9.0	39.7	15.0	39.0					
Max Q Clear Time (g_c+10, s)	22.1	14.7	20.7	9.2	27.7	8.7	15.1					
Green Ext Time (p_c), s	0.0	3.0	0.2	1.1	0.0	3.3	0.1	1.0				
Intersection Summary												
HCM 6th Ctrl Delay	36.0											
HCM 6th LOS	D											

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	127	0	29	8	0	57	7	821	41	300	974	72
Future Volume (veh/h)	127	0	29	8	0	57	7	821	41	300	974	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	0	1900	1870	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	138	0	-8	9	0	0	8	944	13	345	1120	75
Peak Hour Factor	0.92	0.92	0.92	0.87	0.92	0.87	0.92	0.87	0.87	0.87	0.87	0.92
Percent Heavy Veh, %	2	2	2	0	0	0	2	1	1	1	1	1
Cap, veh/h	199	0	515	42	0	0	39	1388	603	419	2041	137
Arrive On Green	0.11	0.00	0.00	0.02	0.00	0.00	0.02	0.39	0.39	0.23	0.60	0.57
Sat Flow, veh/h	1781	1870	0	1810	9		1781	3582	1556	1795	3407	228
Grp Volume(v), veh/h	138	-8	-8	9	24.1		8	944	13	345	588	607
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1810	C		1781	1791	1556	1795	1791	1844
Q Serve(g_s), s	3.3	0.0	0.0	0.2			0.2	9.8	0.2	8.2	8.8	8.9
Cycle Q Clear(g_c), s	3.3	0.0	0.0	0.2			0.2	9.8	0.2	8.2	8.8	8.9
Prop In Lane	1.00		0.00	1.00			1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	199	0	0	42			39	1388	603	419	1073	1105
V/C Ratio(X)	0.69	0.00	0.00	0.22			0.21	0.68	0.02	0.82	0.55	0.55
Avail Cap(c_a), veh/h	437	0	0	222			219	2717	1180	1002	2138	2201
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	0.0	0.0	21.5			21.5	11.4	8.5	16.3	5.4	5.4
Incr Delay (d2), s/veh	4.3	0.0	0.0	2.6			2.6	0.2	0.0	1.6	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	0.1			0.1	2.6	0.1	2.7	1.3	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.5	0.0	0.0	24.1			24.1	11.6	8.5	17.9	5.5	5.6
LnGrp LOS	C	A	A	C			C	B	A	B	A	A
Approach Vol, veh/h	122						965			1540		
Approach Delay, s/veh	26.6						11.7			8.3		
Approach LOS	C						B			A		
Timer - Assigned Phs	1	2	3	4	5	6	7					
Phs Duration (G+Y+Rc), s	4.4	21.4	5.0	4.0	5.0	30.8	9.0					
Change Period (Y+Rc), s	4.0	5.3	4.5	4.5	4.5	5.3	4.5					
Max Green Setting (Gmax), s	25.0	32.7	5.0	39.0	5.0	52.2	10.5					
Max Q Clear Time (g_c+I10, s)	11.8	11.8	2.2	0.0	2.2	10.9	5.3					
Green Ext Time (p_c), s	0.4	4.0	0.0	0.0	0.0	5.0	0.1					

### Intersection Summary










HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	0	49	32	0	309	23	347	37	370	484	50
Future Volume (veh/h)	162	0	49	32	0	309	23	347	37	370	484	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	200	0	-25	40	0	0	28	428	37	457	598	60
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	280	5	4	104	5	0	49	786	68	546	1681	168
Arrive On Green	0.15	0.00	0.00	0.06	0.00	0.00	0.03	0.23	0.20	0.30	0.51	0.48
Sat Flow, veh/h	1810	1900	1610	1795	1885	0	1810	3357	289	1795	3288	329
Grp Volume(v), veh/h	200	0	-25	40	0	0	28	229	236	457	325	333
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1795	1885	0	1810	1805	1840	1795	1791	1826
Q Serve(g_s), s	4.1	0.0	0.0	0.8	0.0	0.0	0.6	4.4	4.4	9.3	4.2	4.3
Cycle Q Clear(g_c), s	4.1	0.0	0.0	0.8	0.0	0.0	0.6	4.4	4.4	9.3	4.2	4.3
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.16	1.00		0.18
Lane Grp Cap(c), veh/h	280	5	4	104	5	0	49	423	431	546	916	934
V/C Ratio(X)	0.71	0.00	-6.07	0.39	0.00	0.00	0.58	0.54	0.55	0.84	0.36	0.36
Avail Cap(c_a), veh/h	467	1856	1573	317	1687	0	278	1288	1313	1423	2423	2470
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.7	0.0	0.0	17.8	0.0	0.0	18.8	13.1	13.2	12.7	5.7	5.8
Incr Delay (d2), s/veh	3.4	0.0	0.0	2.3	0.0	0.0	4.0	0.4	0.4	1.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	0.3	0.0	0.0	0.3	1.3	1.3	3.1	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.1	0.0	0.0	20.1	0.0	0.0	22.8	13.5	13.6	14.0	5.8	5.9
LnGrp LOS	B	A	A	C	A	A	C	B	B	B	A	A
Approach Vol, veh/h	175			40			493			1115		
Approach Delay, s/veh	21.8			20.1			14.1			9.2		
Approach LOS	C			C			B			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), \$5.9	13.2	6.3	3.8	5.0	24.0	10.1	0.0					
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0				
Max Green Setting (Gmax),s	1.0	26.6	6.4	38.2	6.0	51.6	9.6	35.0				
Max Q Clear Time (g_c+I1),s	11.3	6.4	2.8	0.0	2.6	6.3	6.1	0.0				
Green Ext Time (p_c), s	0.7	1.4	0.0	0.0	0.0	2.8	0.2	0.0				

### Intersection Summary









HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Existing Plus Phase 2 AM Peak Hour

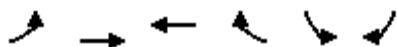







Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	7	0	4	7	0	4	3254	0	4	3254	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3647	0	1781	3647	0	1781	3647	0
Grp Volume(v), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	0	1781	1777	0	1781	1777	0
Q Serve(g_s), 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
Cycle Q Clear(g_c), 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
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	4	7	0	4	7	0	4	3254	0	4	3254	0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	581	3329	0	581	3329	0	581	3254	0	581	3254	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h	0		0				0		0			
Approach Delay, s/veh	0.0		0.0				0.0		0.0			
Approach LOS												
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	0.0	47.5	0.0	0.0	0.0	47.5	0.0	0.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	43.0	43.0	15.0	44.0	15.0	43.0	15.0	44.0				
Max Q Clear Time (g_c+I10), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			0.0									
HCM 6th LOS			A									

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

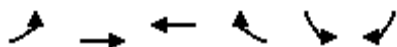
The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	4	8	8	0	1625	1446
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	7294	0	1781	1585
Grp Volume(v), veh/h	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	0	1781	1585
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	4	8	8	0	1625	1446
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	1224	6205	3453	0	1625	1446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		0	0		0	
Approach Delay, s/veh		0.0	0.0		0.0	
Approach LOS						
Timer - Assigned Phs			4		6	7 8
Phs Duration (G+Y+Rc), s			0.0		45.7	0.0 0.0
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			79.3		41.2	30.9 43.9
Max Q Clear Time (g_c+I1), s			0.0		0.0	0.0 0.0
Green Ext Time (p_c), s			0.0		0.0	0.0 0.0
Intersection Summary						
HCM 6th Ctrl Delay			0.0			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Existing Plus Phase 2 AM Peak Hour










Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1	0	314	777	1
Future Volume (veh/h)	0	1	0	314	777	1
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	0	1	0	20	914	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	397	174	174	147	1624	745
Arrive On Green	0.00	0.09	0.00	0.09	0.47	0.00
Sat Flow, veh/h	1392	1870	1870	1585	3483	1598
Grp Volume(v), veh/h	0	1	0	20	914	0
Grp Sat Flow(s), veh/h/ln	1392	1870	1870	1585	1742	1598
Q Serve(g_s), s	0.0	0.0	0.0	0.2	3.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.2	3.4	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	397	174	174	147	1624	745
V/C Ratio(X)	0.00	0.01	0.00	0.14	0.56	0.00
Avail Cap(c_a), veh/h	4564	5772	5772	4892	6910	3170
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	7.5	0.0	7.6	3.5	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	7.5	0.0	7.7	3.6	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		1	20		914	
Approach Delay, s/veh		7.5	7.7		3.6	
Approach LOS		A	A		A	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		5.7			5.7	12.5
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		54.7			54.7	34.7
Max Q Clear Time (g_c+I1), s		2.0			2.2	5.4
Green Ext Time (p_c), s		0.0			0.0	1.8
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			3.7			
HCM 6th LOS			A			



# HCM 6th Signalized Intersection Summary 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	808	0	0	247	957	16	3	136	0	0	0
Future Volume (veh/h)	6	808	0	0	247	957	16	3	136	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No		No				No					
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	6	833	0	0	255	518	18	0	13			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	23	2826	0	0	683	1157	318	0	142			
Arrive On Green	0.01	0.55	0.00	0.00	0.36	0.36	0.09	0.00	0.09			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	6	833	0	0	255	518	18	0	13			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	0.0	1.9	0.0	0.0	2.2	2.7	0.1	0.0	0.2			
Cycle Q Clear(g_c), s	0.0	1.9	0.0	0.0	2.2	2.7	0.1	0.0	0.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	23	2827	0	0	683	1157	318	0	142			
V/C Ratio(X)	0.26	0.29	0.00	0.00	0.37	0.45	0.06	0.00	0.09			
Avail Cap(c_a), veh/h	2513	17409	0	0	4676	7926	7492	0	3333			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	11.0	2.7	0.0	0.0	5.2	5.4	9.2	0.0	9.3			
Incr Delay (d2), s/veh	2.2	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	2.7	0.0	0.0	5.3	5.5	9.3	0.0	9.4			
LnGrp LOS	B	A	A	A	A	A	A	A	A			
Approach Vol, veh/h	839		773			31						
Approach Delay, s/veh	2.8		5.4			9.3						
Approach LOS	A		A			A						
Timer - Assigned Phs	2		4		5	6						
Phs Duration (G+Y+Rc), s	16.2		6.0		4.1	12.0						
Change Period (Y+Rc), s	5.3		5.3		4.0	5.3						
Max Green Setting (Gmax), s	73.7		45.7		16.0	53.7						
Max Q Clear Time (g_c+I1), s	3.9		2.2		2.0	4.7						
Green Ext Time (p_c), s	3.8		0.0		0.0	2.0						

## Intersection Summary




HCM 6th Ctrl Delay	4.2
HCM 6th LOS	A

## Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

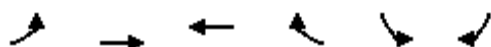
The Ranch  
Existing Plus Phase 2 AM Peak Hour

Intersection						
Int Delay, s/veh	20.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	79	370	26	30	444	45
Future Vol, veh/h	79	370	26	30	444	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	84	394	28	32	472	48
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1036	44	0	0	60	0
Stage 1	44	-	-	-	-	-
Stage 2	992	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	259	1032	-	-	1556	-
Stage 1	984	-	-	-	-	-
Stage 2	362	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	178	1032	-	-	1556	-
Mov Cap-2 Maneuver	178	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	249	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	38	0		7.6		
HCM LOS	E					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		560	1556	
HCM Lane V/C Ratio	-	-		0.853	0.304	
HCM Control Delay (s)	-	-		38	8.3	
HCM Lane LOS	-	-		E	A	
HCM 95th %tile Q(veh)	-	-		9.2	1.3	

# HCM 6th Signalized Intersection Summary

## 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Existing Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↵↵	↗↗	↗↗↗	↗	↵	↗↗	
Traffic Volume (veh/h)	247	1206	729	77	349	746	
Future Volume (veh/h)	247	1206	729	77	349	746	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1870	1870	1796	1796	
Adj Flow Rate, veh/h	268	1311	792	0	379	496	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	1	1	2	2	7	7	
Cap, veh/h	326	1468	1423		881	1380	
Arrive On Green	0.09	0.41	0.28	0.00	0.52	0.52	
Sat Flow, veh/h	3483	3676	5274	1585	1711	2679	
Grp Volume(v), veh/h	268	1311	792	0	379	496	
Grp Sat Flow(s),veh/h/ln	1742	1791	1702	1585	1711	1340	
Q Serve(g_s), s	9.1	40.9	15.9	0.0	16.6	13.2	
Cycle Q Clear(g_c), s	9.1	40.9	15.9	0.0	16.6	13.2	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	326	1468	1423		881	1380	
V/C Ratio(X)	0.82	0.89	0.56		0.43	0.36	
Avail Cap(c_a), veh/h	421	1955	1979		881	1380	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	53.4	33.0	37.0	0.0	18.1	17.3	
Incr Delay (d2), s/veh	7.7	3.7	0.1	0.0	0.1	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	4.2	17.4	6.4	0.0	6.5	12.3	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	61.1	36.7	37.1	0.0	18.2	17.4	
LnGrp LOS	E	D	D		B	B	
Approach Vol, veh/h							
		1579	792	A	875		
Approach Delay, s/veh							
		40.9	37.1		17.7		
Approach LOS							
		D	D		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				53.7	66.3	15.7	37.9
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				65.5	45.5	14.5	46.5
Max Q Clear Time (g_c+I1), s				42.9	18.6	11.1	17.9
Green Ext Time (p_c), s				6.3	1.8	0.2	3.4
Intersection Summary							
HCM 6th Ctrl Delay			33.7				
HCM 6th LOS			C				

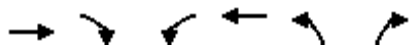
### Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary

## 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Existing Plus Phase 2 AM Peak Hour

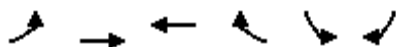







Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	970	584	0	1319	114	21
Future Volume (veh/h)	970	584	0	1319	114	21
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1054	342	0	1434	124	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1725	769	0	1725	1548	710
Arrive On Green	0.49	0.49	0.00	0.49	0.45	0.45
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1054	342	0	1434	124	7
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	26.0	17.0	0.0	41.8	2.5	0.3
Cycle Q Clear(g_c), s	26.0	17.0	0.0	41.8	2.5	0.3
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1725	769	0	1725	1548	710
V/C Ratio(X)	0.61	0.44	0.00	0.83	0.08	0.01
Avail Cap(c_a), veh/h	2636	1176	0	2636	1548	710
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.6	20.3	0.0	26.6	19.0	18.4
Incr Delay (d2), s/veh	0.4	0.4	0.0	1.4	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	6.3	0.0	16.7	1.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.9	20.7	0.0	28.1	19.1	18.4
LnGrp LOS	C	C	A	C	B	B
Approach Vol, veh/h	1396			1434	131	
Approach Delay, s/veh	22.4			28.1	19.0	
Approach LOS	C			C	B	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	57.7			62.3		62.3
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	22.5			88.5		88.5
Max Q Clear Time (g_c+l1), s	4.5			28.0		43.8
Green Ext Time (p_c), s	0.3			12.6		14.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			25.0			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Prewett Ranch Drive & Hillcrest Avenue

The Ranch  
Existing Plus Phase 2 AM Peak Hour





















Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	201	40	43	5	5	143	
Future Volume (veh/h)	201	40	43	5	5	143	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	218	43	47	5	5	155	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	315	852	194	21	395	352	
Arrive On Green	0.18	0.46	0.12	0.10	0.22	0.22	
Sat Flow, veh/h	1781	1870	1662	177	1781	1585	
Grp Volume(v), veh/h	218	43	0	52	5	155	
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1839	1781	1585	
Q Serve(g_s), s	2.8	0.3	0.0	0.6	0.1	2.1	
Cycle Q Clear(g_c), s	2.8	0.3	0.0	0.6	0.1	2.1	
Prop In Lane	1.00			0.10	1.00	1.00	
Lane Grp Cap(c), veh/h	315	852	0	215	395	352	
V/C Ratio(X)	0.69	0.05	0.00	0.24	0.01	0.44	
Avail Cap(c_a), veh/h	395	2113	0	1372	1365	1215	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	9.6	3.8	0.0	10.0	7.5	8.3	
Incr Delay (d2), s/veh	3.7	0.0	0.0	0.6	0.0	0.9	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.2	0.0	2.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	13.3	3.8	0.0	10.5	7.5	9.2	
LnGrp LOS	B	A	A	B	A	A	
Approach Vol, veh/h		261	52		160		
Approach Delay, s/veh		11.7	10.5		9.1		
Approach LOS		B	B		A		
Timer - Assigned Phs							
				4	6	7	8
Phs Duration (G+Y+Rc), s				15.3	9.5	8.4	6.9
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				27.5	18.5	5.0	18.0
Max Q Clear Time (g_c+I1), s				2.3	4.1	4.8	2.6
Green Ext Time (p_c), s				0.2	0.4	0.0	0.1
Intersection Summary							
HCM 6th Ctrl Delay			10.7				
HCM 6th LOS			B				



# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Existing Plus Phase 2 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	193	0	232	643	723	0	0	569	421
Future Volume (veh/h)	0	0	0	193	0	232	643	723	0	0	569	421
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				197	0	43	656	738	0	0	581	116
Peak Hour Factor				0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %				1	0	1	1	1	0	0	1	1
Cap, veh/h				507	0	232	915	2240	0	0	1609	395
Arrive On Green				0.15	0.00	0.15	0.26	0.63	0.00	0.00	0.25	0.25
Sat Flow, veh/h				3483	0	1598	3483	3676	0	0	6749	1591
Grp Volume(v), veh/h				197	0	43	656	738	0	0	581	116
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1742	1791	0	0	1621	1591
Q Serve(g_s), s				1.8	0.0	0.8	6.0	3.4	0.0	0.0	2.6	2.1
Cycle Q Clear(g_c), s				1.8	0.0	0.8	6.0	3.4	0.0	0.0	2.6	2.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				507	0	232	915	2240	0	0	1609	395
V/C Ratio(X)				0.39	0.00	0.18	0.72	0.33	0.00	0.00	0.36	0.29
Avail Cap(c_a), veh/h				4290	0	1968	4489	9131	0	0	7430	1823
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				13.5	0.0	13.1	11.7	3.1	0.0	0.0	10.8	10.6
Incr Delay (d2), s/veh				0.2	0.0	0.1	0.4	0.0	0.0	0.0	0.1	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.5	0.0	0.2	1.5	0.0	0.0	0.0	0.6	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				13.7	0.0	13.2	12.1	3.1	0.0	0.0	10.9	10.8
LnGrp LOS				B	A	B	B	A	A	A	B	B
Approach Vol, veh/h					240			1394			697	
Approach Delay, s/veh					13.6			7.3			10.9	
Approach LOS					B			A			B	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	25.8			13.2			12.7			9.1		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	5.4			8.0			4.6			3.8		
Green Ext Time (p_c), s	3.2			1.2			2.6			0.4		
Intersection Summary												
HCM 6th Ctrl Delay	9.0											
HCM 6th LOS	A											

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	🔴🔴	🔴	🔴					🔴🔴🔴		🔴🔴	🔴🔴	
Traffic Volume (veh/h)	455	0	783	0	0	0	0	911	255	269	492	0
Future Volume (veh/h)	455	0	783	0	0	0	0	911	255	269	492	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	474	0	816				0	949	230	280	512	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1319	0	1173				0	1600	381	405	1676	0
Arrive On Green	0.37	0.00	0.37				0.00	0.30	0.28	0.12	0.47	0.00
Sat Flow, veh/h	3591	0	3195				0	5529	1254	3483	3676	0
Grp Volume(v), veh/h	474	0	816				0	875	304	280	512	0
Grp Sat Flow(s), veh/h/ln	1795	0	1598				0	1621	1655	1742	1791	0
Q Serve(g_s), s	5.4	0.0	12.2				0.0	8.6	8.9	4.4	5.0	0.0
Cycle Q Clear(g_c), s	5.4	0.0	12.2				0.0	8.6	8.9	4.4	5.0	0.0
Prop In Lane	1.00		1.00				0.00		0.76	1.00		0.00
Lane Grp Cap(c), veh/h	1319	0	1173				0	1478	503	405	1676	0
V/C Ratio(X)	0.36	0.00	0.70				0.00	0.59	0.60	0.69	0.31	0.00
Avail Cap(c_a), veh/h	5407	0	4812				0	2585	880	802	2983	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.0	0.0	15.2				0.0	16.7	17.2	24.0	9.3	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.8				0.0	0.1	0.4	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	3.6				0.0	2.6	2.9	1.6	1.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	0.0	15.9				0.0	16.8	17.6	24.8	9.4	0.0
LnGrp LOS	B	A	B				A	B	B	C	A	A
Approach Vol, veh/h	1290						1179			792		
Approach Delay, s/veh	14.9						17.0			14.8		
Approach LOS	B						B			B		
Timer - Assigned Phs	1	2		4			6					
Phs Duration (G+Y+Rc), s	0.6	21.2		24.7			31.7					
Change Period (Y+Rc), s	4.0	5.3		4.5			* 5.3					
Max Green Setting (Gmax), s	3.0	28.7		84.5			* 47					
Max Q Clear Time (g_c+I), s	10.9	10.9		14.2			7.0					
Green Ext Time (p_c), s	0.3	4.8		6.0			2.1					

### Intersection Summary

HCM 6th Ctrl Delay 15.7  
HCM 6th LOS B

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.


















# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	  		 	
Traffic Volume (veh/h)	33	18	101	746	91	162	162	556	772	50	527	29
Future Volume (veh/h)	33	18	101	746	91	162	162	556	772	50	527	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	19	12	769	94	124	167	573	253	52	543	27
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	54	99	63	1062	201	265	216	1003	777	147	839	42
Arrive On Green	0.03	0.09	0.08	0.21	0.27	0.26	0.12	0.28	0.28	0.08	0.24	0.22
Sat Flow, veh/h	1781	1065	673	5023	732	965	1781	3554	2751	1781	3445	171
Grp Volume(v), veh/h	34	0	31	769	0	218	167	573	253	52	280	290
Grp Sat Flow(s),veh/h/ln	1781	0	1737	1674	0	1697	1781	1777	1376	1781	1777	1840
Q Serve(g_s), s	0.9	0.0	0.8	6.9	0.0	5.2	4.4	6.7	3.5	1.3	6.8	6.9
Cycle Q Clear(g_c), s	0.9	0.0	0.8	6.9	0.0	5.2	4.4	6.7	3.5	1.3	6.8	6.9
Prop In Lane	1.00		0.39	1.00		0.57	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	54	0	162	1062	0	465	216	1003	777	147	433	448
V/C Ratio(X)	0.63	0.00	0.19	0.72	0.00	0.47	0.77	0.57	0.33	0.35	0.65	0.65
Avail Cap(c_a), veh/h	368	0	1184	2075	0	1506	846	4916	3806	147	1761	1823
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	0.0	20.4	17.8	0.0	14.8	20.6	14.9	13.7	21.0	16.4	16.5
Incr Delay (d2), s/veh	4.4	0.0	0.2	0.4	0.0	0.3	2.2	0.2	0.1	0.5	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.3	2.2	0.0	1.6	1.6	2.1	0.9	0.5	2.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.6	0.0	20.6	18.1	0.0	15.1	22.8	15.1	13.8	21.5	17.1	17.1
LnGrp LOS	C	A	C	B	A	B	C	B	B	C	B	B
Approach Vol, veh/h	65			987			993			622		
Approach Delay, s/veh	24.3			17.5			16.1			17.4		
Approach LOS	C			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	17.7	14.2	8.5	9.9	15.8	5.5	17.3				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	66.1	20.0	32.4	23.0	47.1	10.0	42.4				
Max Q Clear Time (g_c+I), s	13.3	8.7	8.9	2.8	6.4	8.9	2.9	7.2				
Green Ext Time (p_c), s	0.0	2.9	1.3	0.1	0.2	1.9	0.0	0.8				

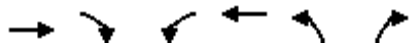
### Intersection Summary

HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	235	605	48	488	511	87
Future Volume (veh/h)	235	605	48	488	511	87
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	245	210	50	508	532	16
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	935	413	254	886	816	374
Arrive On Green	0.27	0.27	0.07	0.48	0.24	0.24
Sat Flow, veh/h	3589	1545	3401	1841	3401	1560
Grp Volume(v), veh/h	245	210	50	508	532	16
Grp Sat Flow(s), veh/h/ln	1749	1545	1700	1841	1700	1560
Q Serve(g_s), s	1.6	3.3	0.4	5.7	4.0	0.2
Cycle Q Clear(g_c), s	1.6	3.3	0.4	5.7	4.0	0.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	935	413	254	886	816	374
V/C Ratio(X)	0.26	0.51	0.20	0.57	0.65	0.04
Avail Cap(c_a), veh/h	4266	1885	664	2861	2062	946
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.3	8.9	12.5	5.3	9.8	8.4
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.6	0.1	0.5	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.3	9.3	12.8	5.5	10.2	8.4
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	455			558	548	
Approach Delay, s/veh	8.8			6.2	10.1	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		10.9	6.1	11.7		17.8
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		17.4	5.1	34.4		44.0
Max Q Clear Time (g_c+I1), s		6.0	2.4	5.3		7.7
Green Ext Time (p_c), s		0.9	0.0	1.2		1.8
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			8.3			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	🚗🚗		🚗🚗🚗					🚗🚗🚗		🚗🚗	🚗🚗🚗	
Traffic Volume (veh/h)	305	0	1465	0	0	0	0	1185	437	333	835	0
Future Volume (veh/h)	305	0	1465	0	0	0	0	1185	437	333	835	0
Initial Q (Qb), veh	0	0	20				0	20	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	0	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	311	0	1061				0	1209	389	340	852	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	0	1				0	1	1	1	1	0
Cap, veh/h	930	0	700				0	1664	493	419	3351	0
Arrive On Green	0.31	0.00	0.31				0.00	0.41	0.40	0.12	0.59	0.00
Sat Flow, veh/h	3483	0	3643				0	4580	1227	3483	5316	0
Grp Volume(v), veh/h	311	0	1061				0	1072	526	340	852	0
Grp Sat Flow(s),veh/h/ln	1742	0	1214				0	1131	1659	1742	1716	0
Q Serve(g_s), s	5.7	0.0	23.8				0.0	22.8	23.0	7.9	6.7	0.0
Cycle Q Clear(g_c), s	5.7	0.0	23.8				0.0	22.8	23.0	7.9	6.7	0.0
Prop In Lane	1.00		1.00				0.00		0.74	1.00		0.00
Lane Grp Cap(c), veh/h	930	0	700				0	1438	698	419	3351	0
V/C Ratio(X)	0.33	0.00	1.51				0.00	0.75	0.75	0.81	0.25	0.00
Avail Cap(c_a), veh/h	1079	0	1129				0	3276	1602	872	4968	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.6	0.0	54.6				0.0	21.6	21.7	44.2	7.1	0.0
Incr Delay (d2), s/veh	0.1	0.0	238.2				0.0	0.3	0.6	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	102.8				0.0	3.1	1.5	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	29.9				0.0	6.6	9.2	4.1	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	0.0	395.6				0.0	24.9	23.9	45.6	7.1	0.0
LnGrp LOS	C	A	F				A	C	C	D	A	A
Approach Vol, veh/h	1372						1598			1192		
Approach Delay, s/veh	313.1						24.6			18.1		
Approach LOS	F						C			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), \$5.3	38.6		30.0	53.9								
Change Period (Y+Rc), s	4.9	* 4.9	5.3	4.9								
Max Green Setting (Gmax), s	1.0	* 80	24.7	80.1								
Max Q Clear Time (g_c+19, s)	25.0		25.8	8.7								
Green Ext Time (p_c), s	0.5	8.7	0.0	3.9								

### Intersection Summary

HCM 6th Ctrl Delay	117.9
HCM 6th LOS	F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Existing Plus Phase 2 PM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗	↗	↖	↖		↖	↗	↗
Traffic Volume (veh/h)	55	46	58	137	32	123	56	804	113	195	917	24
Future Volume (veh/h)	55	46	58	137	32	123	56	804	113	195	917	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	56	47	7	140	33	19	57	820	109	199	936	23
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	99	83	157	229	241	204	79	1130	150	328	1452	36
Arrive On Green	0.10	0.10	0.10	0.13	0.13	0.13	0.04	0.36	0.34	0.09	0.41	0.39
Sat Flow, veh/h	998	837	1574	1795	1885	1594	1795	3172	422	3483	3572	88
Grp Volume(v), veh/h	103	0	7	140	33	19	57	463	466	199	469	490
Grp Sat Flow(s),veh/h/ln	1835	0	1574	1795	1885	1594	1795	1791	1803	1742	1791	1869
Q Serve(g_s), s	2.7	0.0	0.2	3.7	0.8	0.5	1.6	11.1	11.2	2.7	10.5	10.5
Cycle Q Clear(g_c), s	2.7	0.0	0.2	3.7	0.8	0.5	1.6	11.1	11.2	2.7	10.5	10.5
Prop In Lane	0.54		1.00	1.00		1.00	1.00		0.23	1.00		0.05
Lane Grp Cap(c), veh/h	183	0	157	229	241	204	79	638	642	328	728	760
V/C Ratio(X)	0.56	0.00	0.04	0.61	0.14	0.09	0.72	0.73	0.73	0.61	0.64	0.64
Avail Cap(c_a), veh/h	1294	0	1109	1374	1443	1220	579	2706	2723	1123	2706	2823
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	0.0	20.2	20.5	19.2	19.1	23.4	13.9	13.9	21.6	11.8	11.9
Incr Delay (d2), s/veh	1.0	0.0	0.0	1.0	0.1	0.1	4.6	0.6	0.6	0.7	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.1	1.3	0.3	0.2	0.7	3.4	3.5	1.0	3.4	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.3	0.0	20.3	21.5	19.3	19.2	28.1	14.5	14.5	22.3	12.2	12.2
LnGrp LOS	C	A	C	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		110			192			986			1158	
Approach Delay, s/veh		22.2			20.9			15.3			13.9	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	21.7		8.9	6.2	24.2		10.3				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+14), s	14.7	13.2		4.7	3.6	12.5		5.7				
Green Ext Time (p_c), s	0.3	3.6		0.3	0.0	4.5		0.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			15.4									
HCM 6th LOS			B									

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	162	101	39	84	503	117	767	33	747	1061	160
Future Volume (veh/h)	166	162	101	39	84	503	117	767	33	747	1061	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	171	167	37	40	87	519	121	791	33	770	1094	91
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	208	729	158	51	305	1297	245	1004	42	875	1383	771
Arrive On Green	0.12	0.25	0.24	0.03	0.16	0.15	0.14	0.29	0.27	0.25	0.39	0.37
Sat Flow, veh/h	1795	2928	634	1795	1885	3195	1795	3503	146	3483	3582	1576
Grp Volume(v), veh/h	171	101	103	40	87	519	121	404	420	770	1094	91
Grp Sat Flow(s),veh/h/ln	1795	1791	1771	1795	1885	1598	1795	1791	1858	1742	1791	1576
Q Serve(g_s), s	8.1	3.9	4.0	1.9	3.5	10.0	5.4	18.0	18.0	18.4	23.4	1.1
Cycle Q Clear(g_c), s	8.1	3.9	4.0	1.9	3.5	10.0	5.4	18.0	18.0	18.4	23.4	1.1
Prop In Lane	1.00		0.36	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	208	446	441	51	305	1297	245	513	532	875	1383	771
V/C Ratio(X)	0.82	0.23	0.23	0.78	0.29	0.40	0.49	0.79	0.79	0.88	0.79	0.12
Avail Cap(c_a), veh/h	456	1488	1472	228	1327	3030	245	1033	1072	1246	2893	1435
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.4	25.9	26.0	41.8	31.9	18.3	34.6	28.5	28.5	31.2	23.5	3.8
Incr Delay (d2), s/veh	3.1	0.1	0.1	9.2	0.2	0.1	0.6	1.0	1.0	4.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	1.6	1.6	0.9	1.5	3.3	2.3	7.3	7.5	8.0	9.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.5	26.0	26.1	51.0	32.1	18.3	35.2	29.5	29.5	35.3	23.9	3.8
LnGrp LOS	D	C	C	D	C	B	D	C	C	D	C	A
Approach Vol, veh/h	375				646				945		1955	
Approach Delay, s/veh	32.6				22.2				30.3		27.5	
Approach LOS	C				C				C		C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.8	28.8	6.5	25.6	17.1	37.5	14.1	18.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	21.0	48.7	11.0	71.4	11.0	* 69	22.0	60.4				
Max Q Clear Time (g_c+20.4)	20.4	20.0	3.9	6.0	7.4	25.4	10.1	12.0				
Green Ext Time (p_c), s	1.4	2.9	0.0	0.7	0.0	6.7	0.2	1.4				

### Intersection Summary

HCM 6th Ctrl Delay 27.8

HCM 6th LOS C

### Notes

User approved volume balancing among the lanes for turning movement.












\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	77	758	6	41	54	487	774	9	58	934	158
Future Volume (veh/h)	134	77	758	6	41	54	487	774	9	58	934	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	111	123	80	6	43	3	513	815	5	61	983	153
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	221	232	394	9	65	64	666	1804	785	79	1542	239
Arrive On Green	0.12	0.12	0.12	0.04	0.04	0.04	0.19	0.50	0.50	0.04	0.34	0.33
Sat Flow, veh/h	1795	1885	3195	229	1644	1598	3483	3582	1557	1795	4484	696
Grp Volume(v), veh/h	111	123	80	49	0	3	513	815	5	61	752	384
Grp Sat Flow(s),veh/h/ln	1795	1885	1598	1874	0	1598	1742	1791	1557	1795	1716	1749
Q Serve(g_s), s	3.2	3.4	1.2	1.4	0.0	0.1	7.7	8.1	0.1	1.9	10.2	10.3
Cycle Q Clear(g_c), s	3.2	3.4	1.2	1.4	0.0	0.1	7.7	8.1	0.1	1.9	10.2	10.3
Prop In Lane	1.00		1.00	0.12		1.00	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	221	232	394	75	0	64	666	1804	785	79	1180	601
V/C Ratio(X)	0.50	0.53	0.20	0.66	0.00	0.05	0.77	0.45	0.01	0.77	0.64	0.64
Avail Cap(c_a), veh/h	714	750	1271	1321	0	1126	1574	3496	1520	292	2357	1201
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.7	22.7	21.8	26.2	0.0	25.6	21.2	8.8	6.8	26.2	15.3	15.4
Incr Delay (d2), s/veh	0.7	0.7	0.1	3.6	0.0	0.1	0.7	0.1	0.0	5.9	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.3	0.4	0.6	0.0	0.0	2.7	2.2	0.0	0.9	3.5	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.3	23.4	21.9	29.8	0.0	25.7	21.9	8.9	6.8	32.0	15.5	15.8
LnGrp LOS	C	C	C	C	A	C	C	A	A	C	B	B
Approach Vol, veh/h	314			52			1333			1197		
Approach Delay, s/veh	23.0			29.6			13.9			16.4		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	6.4	31.9	10.8		14.6	23.7	6.2					
Change Period (Y+Rc), s	4.0	5.3	4.9		4.0	* 5.3	4.0					
Max Green Setting (Gmax), s	20.0	52.7	21.1		25.0	* 37	39.0					
Max Q Clear Time (g_c+13.9), s	10.1	10.1	5.4		9.7	12.3	3.4					
Green Ext Time (p_c), s	0.0	3.6	0.6		0.9	5.7	0.1					

### Intersection Summary

HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.













\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	985	260	106	768	39	211	54	85	48	31	78
Future Volume (veh/h)	104	985	260	106	768	39	211	54	85	48	31	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	108	1026	177	110	800	14	220	56	27	50	32	16
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	141	1369	603	174	1436	626	342	360	303	70	156	78
Arrive On Green	0.08	0.38	0.38	0.10	0.40	0.40	0.10	0.19	0.19	0.04	0.13	0.11
Sat Flow, veh/h	1795	3582	1578	1795	3582	1563	3483	1885	1585	1795	1182	591
Grp Volume(v), veh/h	108	1026	177	110	800	14	220	56	27	50	0	48
Grp Sat Flow(s),veh/h/ln	1795	1791	1578	1795	1791	1563	1742	1885	1585	1795	0	1773
Q Serve(g_s), s	3.2	13.6	4.3	3.2	9.5	0.3	3.3	1.4	0.8	1.5	0.0	1.3
Cycle Q Clear(g_c), s	3.2	13.6	4.3	3.2	9.5	0.3	3.3	1.4	0.8	1.5	0.0	1.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	141	1369	603	174	1436	626	342	360	303	70	0	233
V/C Ratio(X)	0.77	0.75	0.29	0.63	0.56	0.02	0.64	0.16	0.09	0.72	0.00	0.21
Avail Cap(c_a), veh/h	556	3455	1522	556	3455	1507	888	1544	1298	294	0	1291
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.8	14.7	11.8	23.9	12.7	10.0	23.9	18.5	18.3	26.1	0.0	21.5
Incr Delay (d2), s/veh	3.3	0.3	0.1	1.4	0.1	0.0	0.8	0.1	0.0	5.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	4.3	1.2	1.3	2.9	0.1	1.2	0.5	0.2	0.7	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.1	15.0	11.9	25.3	12.8	10.0	24.6	18.6	18.3	31.1	0.0	21.6
LnGrp LOS	C	B	B	C	B	A	C	B	B	C	A	C
Approach Vol, veh/h	1311			924			303			98		
Approach Delay, s/veh	15.7			14.3			22.9			26.5		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.1	14.5	9.3	25.0	9.4	11.2	8.3	26.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	43.7	43.7	17.0	* 53	14.0	38.7	17.0	* 53				
Max Q Clear Time (g_c+13.5), s	3.4	3.4	5.2	15.6	5.3	3.3	5.2	11.5				
Green Ext Time (p_c), s	0.0	0.2	0.1	5.2	0.2	0.1	0.1	3.5				

### Intersection Summary

HCM 6th Ctrl Delay 16.4

HCM 6th LOS B

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	735	244	291	524	176	305	329	229	252	378	24
Future Volume (veh/h)	67	735	244	291	524	176	305	329	229	252	378	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	70	766	115	303	546	74	318	343	132	262	394	21
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	91	1078	468	345	1586	708	407	543	205	353	688	37
Arrive On Green	0.05	0.30	0.30	0.19	0.44	0.44	0.12	0.21	0.20	0.10	0.20	0.18
Sat Flow, veh/h	1810	3610	1566	1810	3610	1610	3510	2549	962	3510	3484	185
Grp Volume(v), veh/h	70	766	115	303	546	74	318	241	234	262	203	212
Grp Sat Flow(s),veh/h/ln	1810	1805	1566	1810	1805	1610	1755	1805	1706	1755	1805	1864
Q Serve(g_s), s	3.1	15.4	4.5	13.2	8.1	2.2	7.2	9.9	10.2	5.9	8.3	8.4
Cycle Q Clear(g_c), s	3.1	15.4	4.5	13.2	8.1	2.2	7.2	9.9	10.2	5.9	8.3	8.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.56	1.00		0.10
Lane Grp Cap(c), veh/h	91	1078	468	345	1586	708	407	385	364	353	357	368
V/C Ratio(X)	0.77	0.71	0.25	0.88	0.34	0.10	0.78	0.63	0.64	0.74	0.57	0.57
Avail Cap(c_a), veh/h	245	1866	809	557	2488	1110	605	911	861	691	955	987
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	25.4	21.6	32.0	15.0	13.4	34.9	29.0	29.5	35.5	29.5	29.6
Incr Delay (d2), s/veh	5.1	0.3	0.1	5.5	0.0	0.0	2.0	0.6	0.7	1.2	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	6.0	1.5	5.9	2.9	0.7	3.0	4.0	4.0	2.4	3.4	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.2	25.7	21.7	37.4	15.1	13.4	36.9	29.7	30.2	36.7	30.0	30.1
LnGrp LOS	D	C	C	D	B	B	D	C	C	D	C	C
Approach Vol, veh/h	951					923		793		677		
Approach Delay, s/veh	26.5					22.3		32.7		32.6		
Approach LOS	C					C		C		C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.2	21.3	19.5	28.3	13.4	20.1	8.1	39.7				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	60.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7				
Max Q Clear Time (g_c+11), s	12.2	15.2	17.4	9.2	10.4	5.1	10.1					
Green Ext Time (p_c), s	0.3	1.6	0.3	3.3	0.3	1.3	0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay			28.1									
HCM 6th LOS			C									














# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	171	883	15	76	939	227	31	52	41	523	93	98
Future Volume (veh/h)	171	883	15	76	939	227	31	52	41	523	93	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	178	920	6	79	978	62	32	54	9	545	97	26
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	222	1301	579	102	1523	466	49	428	69	669	1089	477
Arrive On Green	0.12	0.36	0.36	0.06	0.30	0.30	0.03	0.14	0.12	0.19	0.30	0.30
Sat Flow, veh/h	1795	3582	1594	1795	5147	1574	1795	3079	500	3483	3582	1568
Grp Volume(v), veh/h	178	920	6	79	978	62	32	31	32	545	97	26
Grp Sat Flow(s),veh/h/ln	1795	1791	1594	1795	1716	1574	1795	1791	1788	1742	1791	1568
Q Serve(g_s), s	6.2	14.1	0.2	2.8	10.6	1.9	1.1	1.0	1.0	9.6	1.2	0.8
Cycle Q Clear(g_c), s	6.2	14.1	0.2	2.8	10.6	1.9	1.1	1.0	1.0	9.6	1.2	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	222	1301	579	102	1523	466	49	249	248	669	1089	477
V/C Ratio(X)	0.80	0.71	0.01	0.78	0.64	0.13	0.66	0.12	0.13	0.81	0.09	0.05
Avail Cap(c_a), veh/h	391	2750	1224	308	3711	1135	140	1247	1245	1031	3275	1433
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.4	17.5	13.1	29.9	19.6	16.6	30.9	24.2	24.4	24.8	16.0	15.8
Incr Delay (d2), s/veh	2.5	0.3	0.0	4.7	0.2	0.0	5.5	0.1	0.1	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	4.9	0.0	1.2	3.6	0.6	0.5	0.4	0.4	3.6	0.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.9	17.8	13.1	34.6	19.8	16.6	36.5	24.3	24.5	26.4	16.0	15.8
LnGrp LOS	C	B	B	C	B	B	D	C	C	C	B	B
Approach Vol, veh/h	1104			1119			95			668		
Approach Delay, s/veh	19.7			20.7			28.5			24.5		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.9	7.6	27.3	5.7	23.5	12.0	23.0					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	11.0	48.0	5.0	57.4	14.0	45.0					
Max Q Clear Time (g_c+I1), s	3.0	4.8	16.1	3.1	3.2	8.2	12.6					
Green Ext Time (p_c), s	0.7	0.2	0.0	4.1	0.0	0.4	0.1	4.6				

### Intersection Summary

HCM 6th Ctrl Delay	21.4
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1547	670	152	1587	0	0	0	0	674	3	662
Future Volume (veh/h)	0	1547	670	152	1587	0	0	0	0	674	3	662
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1628	297	160	1671	0				711	0	669
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1866	568	191	2537	0				1607	0	715
Arrive On Green	0.00	0.36	0.36	0.10	0.49	0.00				0.44	0.00	0.44
Sat Flow, veh/h	0	5358	1579	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	1628	297	160	1671	0				711	0	669
Grp Sat Flow(s),veh/h/ln	0	1729	1579	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	35.1	17.8	9.5	29.1	0.0				16.3	0.0	47.4
Cycle Q Clear(g_c), s	0.0	35.1	17.8	9.5	29.1	0.0				16.3	0.0	47.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1866	568	191	2537	0				1607	0	715
V/C Ratio(X)	0.00	0.87	0.52	0.84	0.66	0.00				0.44	0.00	0.94
Avail Cap(c_a), veh/h	0	1990	606	266	2856	0				1993	0	887
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	35.8	30.3	53.3	23.1	0.0				23.0	0.0	31.7
Incr Delay (d2), s/veh	0.0	4.1	0.3	11.2	0.3	0.0				0.1	0.0	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.8	6.5	2.6	11.1	0.0				6.6	0.0	19.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	39.9	30.5	64.5	23.4	0.0				23.1	0.0	45.3
LnGrp LOS	A	D	C	E	C	A				C	A	D
Approach Vol, veh/h		1925			1831						1380	
Approach Delay, s/veh		38.5			27.0						33.9	
Approach LOS		D			C						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.5	47.1		57.2		62.6						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	6.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I1), s	11.5	37.1		49.4		31.1						
Green Ext Time (p_c), s	0.1	4.7		2.6		9.5						

### Intersection Summary

HCM 6th Ctrl Delay	33.1
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1776	445	38	1047	453	692	38	243	0	0	0
Future Volume (veh/h)	0	1776	445	38	1047	453	692	38	243	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	0	1869	301	40	1102	265	757	0	109			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	1	1	1	1	1	1	1	1			
Cap, veh/h	0	2624	802	57	3108	938	974	0	433			
Arrive On Green	0.00	0.51	0.51	0.03	0.60	0.60	0.27	0.00	0.27			
Sat Flow, veh/h	0	5316	1573	1795	5147	1553	3591	0	1598			
Grp Volume(v), veh/h	0	1869	301	40	1102	265	757	0	109			
Grp Sat Flow(s),veh/h/ln	0	1716	1573	1795	1716	1553	1795	0	1598			
Q Serve(g_s), s	0.0	17.9	7.4	1.4	6.9	5.2	12.5	0.0	3.4			
Cycle Q Clear(g_c), s	0.0	17.9	7.4	1.4	6.9	5.2	12.5	0.0	3.4			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2624	802	57	3108	938	974	0	433			
V/C Ratio(X)	0.00	0.71	0.38	0.70	0.35	0.28	0.78	0.00	0.25			
Avail Cap(c_a), veh/h	0	3852	1177	308	5056	1526	2744	0	1221			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	12.1	9.5	30.7	6.4	6.1	21.6	0.0	18.3			
Incr Delay (d2), s/veh	0.0	0.1	0.1	5.7	0.0	0.1	0.5	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	5.1	1.9	0.6	1.6	1.1	4.6	0.0	1.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.2	9.6	36.4	6.4	6.1	22.1	0.0	18.4			
LnGrp LOS	A	B	A	D	A	A	C	A	B			
Approach Vol, veh/h		2170			1407			866				
Approach Delay, s/veh		11.9			7.2			21.6				
Approach LOS		B			A			C				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	6.0	36.7		21.4		42.7						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	1.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+I), s	13.4	19.9		14.5		8.9						
Green Ext Time (p_c), s	0.0	11.4		1.6		6.0						

### Intersection Summary

HCM 6th Ctrl Delay	12.3
HCM 6th LOS	B

### Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	51	0	9	47	162	5	53	9	189	97	38
Future Volume (veh/h)	34	51	0	9	47	162	5	53	9	189	97	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	37	55	-2	10	51	82	5	57	2	203	104	33
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	204	199	0	204	69	110	204	554	19	303	573	175
Arrive On Green	0.11	0.11	0.00	0.11	0.11	0.11	0.11	0.16	0.12	0.17	0.21	0.18
Sat Flow, veh/h	1795	1885	0	1795	651	1046	1795	3531	123	1795	2700	823
Grp Volume(v), veh/h	37	53	0	10	0	133	5	29	30	203	68	69
Grp Sat Flow(s),veh/h/ln	1795	1885	0	1795	0	1697	1795	1791	1863	1795	1791	1732
Q Serve(g_s), s	0.7	0.9	0.0	0.2	0.0	2.7	0.1	0.5	0.5	3.7	1.1	1.2
Cycle Q Clear(g_c), s	0.7	0.9	0.0	0.2	0.0	2.7	0.1	0.5	0.5	3.7	1.1	1.2
Prop In Lane	1.00		0.00	1.00		0.62	1.00		0.07	1.00		0.48
Lane Grp Cap(c), veh/h	204	199	0	204	0	179	204	281	292	303	380	367
V/C Ratio(X)	0.18	0.27	0.00	0.05	0.00	0.74	0.02	0.10	0.10	0.67	0.18	0.19
Avail Cap(c_a), veh/h	561	1929	0	561	0	1737	1072	2596	2701	1072	2596	2510
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.1	14.5	0.0	13.9	0.0	15.3	13.9	12.7	12.7	13.7	11.3	11.6
Incr Delay (d2), s/veh	0.2	0.3	0.0	0.0	0.0	2.3	0.0	0.1	0.1	1.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.0	0.1	0.0	0.9	0.0	0.1	0.1	1.1	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	14.7	0.0	13.9	0.0	17.5	13.9	12.8	12.8	14.6	11.4	11.7
LnGrp LOS	B	B	A	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	90			143			64			340		
Approach Delay, s/veh	14.5			17.3			12.9			13.4		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	9.5	8.0	7.7	8.0	11.5	8.0	7.7				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+15, s)	2.5	2.5	2.2	2.9	2.1	3.2	2.7	4.7				
Green Ext Time (p_c), s	0.2	0.2	0.0	0.1	0.0	0.4	0.0	0.4				

## Intersection Summary









HCM 6th Ctrl Delay	14.4
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	105	86	66	90	72	155	654	159	107	708	88
Future Volume (veh/h)	65	105	86	66	90	72	155	654	159	107	708	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	70	113	72	71	97	48	167	703	155	115	761	86
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	93	154	98	94	170	84	218	1107	244	150	1108	125
Arrive On Green	0.05	0.14	0.14	0.05	0.14	0.14	0.12	0.38	0.35	0.08	0.34	0.31
Sat Flow, veh/h	1810	1085	691	1810	1200	594	1810	2940	648	1810	3269	369
Grp Volume(v), veh/h	70	0	185	71	0	145	167	431	427	115	420	427
Grp Sat Flow(s),veh/h/ln	1810	0	1776	1810	0	1793	1810	1805	1783	1810	1805	1834
Q Serve(g_s), s	1.8	0.0	4.6	1.8	0.0	3.5	4.1	9.0	9.1	2.9	9.2	9.3
Cycle Q Clear(g_c), s	1.8	0.0	4.6	1.8	0.0	3.5	4.1	9.0	9.1	2.9	9.2	9.3
Prop In Lane	1.00		0.39	1.00		0.33	1.00		0.36	1.00		0.20
Lane Grp Cap(c), veh/h	93	0	251	94	0	255	218	679	671	150	612	622
V/C Ratio(X)	0.75	0.00	0.74	0.76	0.00	0.57	0.77	0.64	0.64	0.77	0.69	0.69
Avail Cap(c_a), veh/h	432	0	1426	393	0	1401	746	1567	1548	668	1489	1512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.6	0.0	18.9	21.6	0.0	18.4	19.6	11.8	12.0	20.7	13.1	13.2
Incr Delay (d2), s/veh	4.5	0.0	1.6	4.6	0.0	0.7	2.1	0.4	0.4	3.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.6	0.8	0.0	1.2	1.5	2.6	2.6	1.1	2.8	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.1	0.0	20.5	26.2	0.0	19.2	21.8	12.1	12.4	23.7	13.6	13.7
LnGrp LOS	C	A	C	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	255				216		1025				962	
Approach Delay, s/veh	22.1				21.5		13.8				14.9	
Approach LOS	C				C		B				B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.8	21.3	6.4	10.5	9.5	19.6	6.4	10.5				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	7.8	38.7	10.0	37.0	19.0	36.7	11.0	36.0				
Max Q Clear Time (g_c+14), s	14.9	11.1	3.8	6.6	6.1	11.3	3.8	5.5				
Green Ext Time (p_c), s	0.1	3.2	0.0	0.6	0.2	3.0	0.0	0.4				

### Intersection Summary











HCM 6th Ctrl Delay	15.8
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	0	19	39	0	249	23	666	15	53	569	231
Future Volume (veh/h)	125	0	19	39	0	249	23	666	15	53	569	231
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	1870	1870	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	136	0	-5	45	0	117	25	774	4	62	662	251
Peak Hour Factor	0.92	0.92	0.92	0.86	0.92	0.86	0.92	0.86	0.86	0.86	0.86	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	0	0	0	0	0
Cap, veh/h	192	0	238	70	0	153	74	1335	582	88	964	366
Arrive On Green	0.11	0.00	0.00	0.04	0.00	0.10	0.04	0.37	0.37	0.05	0.38	0.35
Sat Flow, veh/h	1781	1870	0	1810	0	1585	1781	3610	1574	1810	2560	970
Grp Volume(v), veh/h	136	-5	-5	45	0	117	25	774	4	62	467	446
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1810	0	1585	1781	1805	1574	1810	1805	1725
Q Serve(g_s), s	3.2	0.0	0.0	1.1	0.0	3.1	0.6	7.5	0.1	1.5	9.5	9.6
Cycle Q Clear(g_c), s	3.2	0.0	0.0	1.1	0.0	3.1	0.6	7.5	0.1	1.5	9.5	9.6
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.56
Lane Grp Cap(c), veh/h	192	0	0	70	0	153	74	1335	582	88	680	650
V/C Ratio(X)	0.71	0.00	0.00	0.65	0.00	0.76	0.34	0.58	0.01	0.71	0.69	0.69
Avail Cap(c_a), veh/h	224	0	0	1407	0	1703	224	3343	1458	455	1898	1815
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.8	0.0	0.0	20.7	0.0	19.3	20.4	11.1	8.7	20.5	11.5	11.8
Incr Delay (d2), s/veh	8.2	0.0	0.0	3.7	0.0	3.0	2.7	0.1	0.0	3.9	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0	0.4	0.0	1.1	0.3	2.0	0.0	0.6	2.6	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.0	0.0	0.0	24.4	0.0	22.2	23.1	11.2	8.7	24.4	11.9	12.3
LnGrp LOS	C	A	A	C	A	C	C	B	A	C	B	B
Approach Vol, veh/h	126			162			803			975		
Approach Delay, s/veh	29.1			22.8			11.6			12.9		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.1	20.2	5.7	11.8	5.8	20.5	8.7	8.7				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.5	4.5	5.3	4.5	* 4.5				
Max Green Setting (Gmax), s	1.0	39.2	34.0	18.0	5.0	44.7	5.0	* 47				
Max Q Clear Time (g_c+I), s	13.5	9.5	3.1	0.0	2.6	11.6	5.2	5.1				
Green Ext Time (p_c), s	0.0	3.3	0.0	0.0	0.0	3.6	0.0	0.4				

### Intersection Summary

HCM 6th Ctrl Delay 14.1

HCM 6th LOS B

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	0	46	74	0	57	78	282	37	24	289	155
Future Volume (veh/h)	150	0	46	74	0	57	78	282	37	24	289	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	170	0	-8	84	0	7	89	320	34	27	328	165
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	442	335	284	517	0	284	130	1180	124	49	734	362
Arrive On Green	0.18	0.00	0.00	0.18	0.00	0.18	0.07	0.36	0.31	0.03	0.31	0.27
Sat Flow, veh/h	1431	1900	1610	1440	0	1610	1810	3295	348	1810	2343	1154
Grp Volume(v), veh/h	170	0	-8	84	0	7	89	174	180	27	251	242
Grp Sat Flow(s), veh/h/ln	1431	1900	1610	1440	0	1610	1810	1805	1837	1810	1805	1692
Q Serve(g_s), s	3.2	0.0	0.0	1.4	0.0	0.1	1.3	1.9	1.9	0.4	3.0	3.2
Cycle Q Clear(g_c), s	4.6	0.0	0.0	1.4	0.0	0.1	1.3	1.9	1.9	0.4	3.0	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.19	1.00		0.68
Lane Grp Cap(c), veh/h	442	335	284	517	0	284	130	646	658	49	566	530
V/C Ratio(X)	0.38	0.00	-0.03	0.16	0.00	0.02	0.68	0.27	0.27	0.55	0.44	0.46
Avail Cap(c_a), veh/h	2489	3053	2587	2577	0	2587	1850	3230	3288	991	2373	2225
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.9	0.0	0.0	9.9	0.0	9.3	12.4	6.2	6.3	13.2	7.5	7.9
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	0.0	0.0	2.4	0.1	0.1	3.5	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	0.3	0.0	0.0	0.4	0.3	0.3	0.2	0.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	0.0	0.0	9.9	0.0	9.3	14.8	6.3	6.4	16.7	7.7	8.1
LnGrp LOS	B	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h	162			91			443			520		
Approach Delay, s/veh	12.7			9.9			8.1			8.4		
Approach LOS	B			A			A			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	13.8		8.8	6.0	12.6		8.8				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	47.7	47.7		44.0	28.0	34.7		44.0				
Max Q Clear Time (g_c+1), s	3.9	3.9		6.6	3.3	5.2		3.4				
Green Ext Time (p_c), s	0.0	1.1		0.2	0.1	2.1		0.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				8.9								
HCM 6th LOS				A								



# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Existing Plus Phase 2 PM Peak Hour



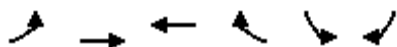
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑		↰	↑↑		↰	↑↑		↰	↑↑	
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	5	9	0	5	9	0	5	3184	0	5	3184	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3647	0	1781	3647	0	1781	3647	0
Grp Volume(v), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	0	1781	1777	0	1781	1777	0
Q Serve(g_s), 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
Cycle Q Clear(g_c), 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
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	5	9	0	5	9	0	5	3184	0	5	3184	0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	254	3184	0	254	3184	0	254	3184	0	254	3184	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h	0		0				0		0			
Approach Delay, s/veh	0.0		0.0				0.0		0.0			
Approach LOS												
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	0.0	38.5	0.0	0.0	0.0	38.5	0.0	0.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	34.0	5.0	34.0	5.0	34.0	5.0	34.0				
Max Q Clear Time (g_c+I10), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			0.0									
HCM 6th LOS			A									








# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

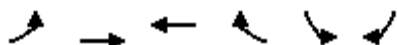
The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	4	8	8	0	1625	1446
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1781	3647	7294	0	1781	1585
Grp Volume(v), veh/h	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	0	1781	1585
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	4	8	8	0	1625	1446
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	1224	6205	3453	0	1625	1446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		0	0		0	
Approach Delay, s/veh		0.0	0.0		0.0	
Approach LOS						
Timer - Assigned Phs			4		6	7 8
Phs Duration (G+Y+Rc), s			0.0		45.7	0.0 0.0
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			79.3		41.2	30.9 43.9
Max Q Clear Time (g_c+I1), s			0.0		0.0	0.0 0.0
Green Ext Time (p_c), s			0.0		0.0	0.0 0.0
Intersection Summary						
HCM 6th Ctrl Delay			0.0			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	147	1316	0
Future Volume (veh/h)	0	0	0	147	1316	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	0	0	0	11	1430	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	317	131	131	111	2031	932
Arrive On Green	0.00	0.00	0.00	0.07	0.58	0.00
Sat Flow, veh/h	1426	1900	1900	1610	3510	1610
Grp Volume(v), veh/h	0	0	0	11	1430	0
Grp Sat Flow(s), veh/h/ln	1426	1900	1900	1610	1755	1610
Q Serve(g_s), s	0.0	0.0	0.0	0.1	6.6	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.1	6.6	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	317	131	131	111	2031	932
V/C Ratio(X)	0.00	0.00	0.00	0.10	0.70	0.00
Avail Cap(c_a), veh/h	1035	1088	1088	922	12215	5603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	9.9	3.4	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	10.0	3.6	0.0
LnGrp LOS	A	A	A	B	A	A
Approach Vol, veh/h		0	11		1430	
Approach Delay, s/veh		0.0	10.0		3.6	
Approach LOS			B		A	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		5.6			5.6	17.1
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		11.7			11.7	77.7
Max Q Clear Time (g_c+I1), s		0.0			2.1	8.6
Green Ext Time (p_c), s		0.0			0.0	3.3

## Intersection Summary

HCM 6th Ctrl Delay	3.6
HCM 6th LOS	A

## Notes

User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↑			↑↑	↰	↰	↰	↰			
Traffic Volume (veh/h)	10	1306	0	0	143	935	4	5	196	0	0	0
Future Volume (veh/h)	10	1306	0	0	143	935	4	5	196	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	11	1375	0	0	151	486	4	5	163			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	41	2816	0	0	741	1255	316	331	281			
Arrive On Green	0.01	0.54	0.00	0.00	0.39	0.39	0.17	0.17	0.17			
Sat Flow, veh/h	3510	5358	0	0	1900	3220	1810	1900	1610			
Grp Volume(v), veh/h	11	1375	0	0	151	486	4	5	163			
Grp Sat Flow(s),veh/h/ln	1755	1729	0	0	1900	1610	1810	1900	1610			
Q Serve(g_s), s	0.1	4.7	0.0	0.0	1.5	3.1	0.1	0.1	2.6			
Cycle Q Clear(g_c), s	0.1	4.7	0.0	0.0	1.5	3.1	0.1	0.1	2.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	41	2816	0	0	741	1255	316	331	281			
V/C Ratio(X)	0.27	0.49	0.00	0.00	0.20	0.39	0.01	0.02	0.58			
Avail Cap(c_a), veh/h	1985	13749	0	0	3693	6260	3006	3156	2675			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	13.9	4.0	0.0	0.0	5.7	6.2	9.7	9.7	10.7			
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0	2.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.1	4.1	0.0	0.0	5.8	6.3	9.7	9.7	11.4			
LnGrp LOS	B	A	A	A	A	A	A	A	B			
Approach Vol, veh/h	1386			637			172					
Approach Delay, s/veh	4.2			6.2			11.3					
Approach LOS	A			A			B					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	19.4			8.9		4.3	15.0					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	73.7			45.7		16.0	53.7					
Max Q Clear Time (g_c+I1), s	6.7			4.6		2.1	5.1					
Green Ext Time (p_c), s	7.4			0.3		0.0	1.5					

### Intersection Summary




HCM 6th Ctrl Delay	5.3
HCM 6th LOS	A

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Existing Plus Phase 2 PM Peak Hour

Intersection						
Int Delay, s/veh	12.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	460	48	35	381	37
Future Vol, veh/h	34	460	48	35	381	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	37	505	53	38	419	41
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	951	72	0	0	91	0
Stage 1	72	-	-	-	-	-
Stage 2	879	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	291	996	-	-	1517	-
Stage 1	956	-	-	-	-	-
Stage 2	409	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	209	996	-	-	1517	-
Mov Cap-2 Maneuver	209	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	293	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	18.9	0	7.5			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	791	1517	-	
HCM Lane V/C Ratio	-	-	0.686	0.276	-	
HCM Control Delay (s)	-	-	18.9	8.3	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	5.6	1.1	-	

# HCM 6th Signalized Intersection Summary

## 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Existing Plus Phase 2 PM Peak Hour



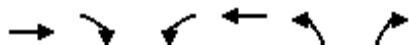
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↱	↰↱	↰↱	↰	↰	↰↱	
Traffic Volume (veh/h)	113	1241	840	30	571	576	
Future Volume (veh/h)	113	1241	840	30	571	576	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	120	1320	894	0	607	589	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	191	1471	1151		920	1595	
Arrive On Green	0.06	0.41	0.32	0.00	0.52	0.52	
Sat Flow, veh/h	3456	3647	3647	1585	1781	2790	
Grp Volume(v), veh/h	120	1320	894	0	607	589	
Grp Sat Flow(s),veh/h/ln	1728	1777	1777	1585	1781	1395	
Q Serve(g_s), s	3.9	39.8	26.1	0.0	28.7	13.2	
Cycle Q Clear(g_c), s	3.9	39.8	26.1	0.0	28.7	13.2	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	191	1471	1151		920	1595	
V/C Ratio(X)	0.63	0.90	0.78		0.66	0.37	
Avail Cap(c_a), veh/h	361	1740	1245		920	1595	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	53.2	31.4	35.1	0.0	20.4	13.4	
Incr Delay (d2), s/veh	1.3	5.3	2.6	0.0	1.4	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.7	17.0	11.2	0.0	11.9	13.4	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	54.4	36.8	37.7	0.0	21.8	13.4	
LnGrp LOS	D	D	D		C	B	
Approach Vol, veh/h		1440	894	A	1196		
Approach Delay, s/veh		38.2	37.7		17.7		
Approach LOS		D	D		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				51.6	63.4	10.4	41.2
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				55.8	50.2	11.5	39.8
Max Q Clear Time (g_c+I1), s				41.8	30.7	5.9	28.1
Green Ext Time (p_c), s				5.3	2.4	0.1	3.1
Intersection Summary							
HCM 6th Ctrl Delay			31.1				
HCM 6th LOS			C				

### Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Existing Plus Phase 2 PM Peak Hour

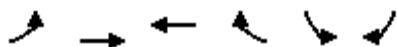







Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑	↘↘	↗
Traffic Volume (veh/h)	1322	498	0	1179	202	65
Future Volume (veh/h)	1322	498	0	1179	202	65
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1437	330	0	1282	220	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1822	813	0	1822	1444	662
Arrive On Green	0.51	0.51	0.00	0.51	0.42	0.42
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1437	330	0	1282	220	17
Grp Sat Flow(s),veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	38.0	14.7	0.0	31.6	4.6	0.7
Cycle Q Clear(g_c), s	38.0	14.7	0.0	31.6	4.6	0.7
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1822	813	0	1822	1444	662
V/C Ratio(X)	0.79	0.41	0.00	0.70	0.15	0.03
Avail Cap(c_a), veh/h	2565	1144	0	2565	1444	662
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.9	17.2	0.0	21.4	20.8	19.7
Incr Delay (d2), s/veh	1.1	0.3	0.0	0.5	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	5.4	0.0	12.2	1.9	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.1	17.6	0.0	21.9	21.0	19.8
LnGrp LOS	C	B	A	C	C	B
Approach Vol, veh/h	1767			1282	237	
Approach Delay, s/veh	22.8			21.9	20.9	
Approach LOS	C			C	C	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	52.0		63.0		63.0	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	23.5		82.5		82.5	
Max Q Clear Time (g_c+I1), s	6.6		40.0		33.6	
Green Ext Time (p_c), s	0.7		18.4		11.8	
Intersection Summary						
HCM 6th Ctrl Delay			22.3			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Prewett Ranch Drive & Hillcrest Avenue

The Ranch  
Existing Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	176	43	31	4	7	157	
Future Volume (veh/h)	176	43	31	4	7	157	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	187	46	33	4	7	167	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	300	828	178	22	405	360	
Arrive On Green	0.17	0.44	0.11	0.09	0.23	0.23	
Sat Flow, veh/h	1781	1870	1636	198	1781	1585	
Grp Volume(v), veh/h	187	46	0	37	7	167	
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1835	1781	1585	
Q Serve(g_s), s	2.4	0.3	0.0	0.4	0.1	2.2	
Cycle Q Clear(g_c), s	2.4	0.3	0.0	0.4	0.1	2.2	
Prop In Lane	1.00			0.11	1.00	1.00	
Lane Grp Cap(c), veh/h	300	828	0	200	405	360	
V/C Ratio(X)	0.62	0.06	0.00	0.19	0.02	0.46	
Avail Cap(c_a), veh/h	405	2162	0	1401	1397	1244	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	9.4	3.9	0.0	9.8	7.3	8.1	
Incr Delay (d2), s/veh	2.1	0.0	0.0	0.4	0.0	0.9	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.1	0.0	0.1	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	11.5	3.9	0.0	10.3	7.3	9.0	
LnGrp LOS	B	A	A	B	A	A	
Approach Vol, veh/h		233	37		174		
Approach Delay, s/veh		10.0	10.3		8.9		
Approach LOS		A	B		A		
Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			14.7		9.5	8.1	6.6
Change Period (Y+Rc), s			4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s			27.5		18.5	5.0	18.0
Max Q Clear Time (g_c+I1), s			2.3		4.2	4.4	2.4
Green Ext Time (p_c), s			0.2		0.4	0.0	0.1
Intersection Summary							
HCM 6th Ctrl Delay			9.6				
HCM 6th LOS			A				






# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Near Term Plus Phase 1 AM Peak Hour







												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	240	0	300	1063	823	0	0	696	440
Future Volume (veh/h)	0	0	0	240	0	300	1063	823	0	0	696	440
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				282	0	221	1251	968	0	0	819	166
Peak Hour Factor				0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %				1	0	1	2	2	0	0	2	2
Cap, veh/h				666	0	306	1402	2453	0	0	1448	354
Arrive On Green				0.19	0.00	0.19	0.41	0.69	0.00	0.00	0.23	0.23
Sat Flow, veh/h				3483	0	1598	3456	3647	0	0	6696	1571
Grp Volume(v), veh/h				282	0	221	1251	968	0	0	819	166
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1728	1777	0	0	1609	1571
Q Serve(g_s), s				4.8	0.0	8.8	22.7	7.8	0.0	0.0	7.6	6.2
Cycle Q Clear(g_c), s				4.8	0.0	8.8	22.7	7.8	0.0	0.0	7.6	6.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				666	0	306	1402	2453	0	0	1448	354
V/C Ratio(X)				0.42	0.00	0.72	0.89	0.39	0.00	0.00	0.57	0.47
Avail Cap(c_a), veh/h				2220	0	1018	2305	4688	0	0	3815	931
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				24.0	0.0	25.6	18.7	4.5	0.0	0.0	23.2	22.6
Incr Delay (d2), s/veh				0.2	0.0	1.2	1.6	0.0	0.0	0.0	0.1	0.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.8	0.0	3.1	7.7	1.5	0.0	0.0	2.6	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				24.2	0.0	26.8	20.3	4.5	0.0	0.0	23.3	23.0
LnGrp LOS				C	A	C	C	A	A	A	C	C
Approach Vol, veh/h					503			2219			985	
Approach Delay, s/veh					25.3			13.4			23.3	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		50.6			31.4	19.2		16.9				
Change Period (Y+Rc), s		5.3			4.0	5.3		5.3				
Max Green Setting (Gmax), s		87.7			45.0	38.7		41.7				
Max Q Clear Time (g_c+I1), s		9.8			24.7	9.6		10.8				
Green Ext Time (p_c), s		4.5			2.6	3.9		0.8				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				17.6								
HCM 6th LOS				B								

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	370	0	583	0	0	0	0	1526	200	290	666	0
Future Volume (veh/h)	370	0	583	0	0	0	0	1526	200	290	666	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1885	1885	1870	1870	0
Adj Flow Rate, veh/h	430	0	678				0	1774	214	337	774	0
Peak Hour Factor	0.86	0.86	0.86				0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3				0	1	1	2	2	0
Cap, veh/h	1035	0	921				0	2477	299	437	2069	0
Arrive On Green	0.29	0.00	0.29				0.00	0.42	0.40	0.13	0.58	0.00
Sat Flow, veh/h	3534	0	3145				0	6171	713	3456	3647	0
Grp Volume(v), veh/h	430	0	678				0	1461	527	337	774	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1621	1756	1728	1777	0
Q Serve(g_s), s	7.3	0.0	14.5				0.0	18.6	18.7	7.0	8.7	0.0
Cycle Q Clear(g_c), s	7.3	0.0	14.5				0.0	18.6	18.7	7.0	8.7	0.0
Prop In Lane	1.00		1.00				0.00		0.41	1.00		0.00
Lane Grp Cap(c), veh/h	1035	0	921				0	2040	736	437	2069	0
V/C Ratio(X)	0.42	0.00	0.74				0.00	0.72	0.72	0.77	0.37	0.00
Avail Cap(c_a), veh/h	3275	0	2914				0	2743	990	789	3006	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.2	0.0	23.7				0.0	17.9	18.2	31.5	8.3	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.2				0.0	0.3	0.9	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	4.9				0.0	5.9	6.7	2.8	2.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	0.0	24.9				0.0	18.3	19.0	32.6	8.4	0.0
LnGrp LOS	C	A	C				A	B	B	C	A	A
Approach Vol, veh/h	1108						1988			1111		
Approach Delay, s/veh	23.6						18.5			15.7		
Approach LOS	C						B			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	3.4	35.2	25.8	48.7								
Change Period (Y+Rc), s	4.0	5.3	4.5	* 5.3								
Max Green Setting (Gmax), s	7.0	40.7	68.5	* 63								
Max Q Clear Time (g_c+19, s)	19.0	20.7	16.5	10.7								
Green Ext Time (p_c), s	0.4	9.3	4.8	3.4								

### Intersection Summary

HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.















\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	 		 	
Traffic Volume (veh/h)	20	0	90	462	80	110	240	490	981	30	620	30
Future Volume (veh/h)	20	0	90	462	80	110	240	490	981	30	620	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1841	1841	1841	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	24	0	0	544	94	70	282	576	412	35	729	30
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	8	8	4	4	4	2	2	2	5	5	5
Cap, veh/h	38	62	0	766	164	122	342	1488	1150	136	1035	43
Arrive On Green	0.02	0.00	0.00	0.15	0.17	0.16	0.19	0.42	0.42	0.08	0.30	0.29
Sat Flow, veh/h	1697	1781	0	4944	980	730	1781	3554	2745	1739	3395	140
Grp Volume(v), veh/h	24	0	0	544	0	164	282	576	412	35	372	387
Grp Sat Flow(s),veh/h/ln	1697	1781	0	1648	0	1709	1781	1777	1373	1739	1735	1800
Q Serve(g_s), s	0.7	0.0	0.0	5.3	0.0	4.5	7.8	5.7	5.2	1.0	9.7	9.7
Cycle Q Clear(g_c), s	0.7	0.0	0.0	5.3	0.0	4.5	7.8	5.7	5.2	1.0	9.7	9.7
Prop In Lane	1.00		0.00	1.00		0.43	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	38	62	0	766	0	286	342	1488	1150	136	529	549
V/C Ratio(X)	0.63	0.00	0.00	0.71	0.00	0.57	0.82	0.39	0.36	0.26	0.70	0.70
Avail Cap(c_a), veh/h	166	1036	0	1161	0	1228	593	3359	2595	136	1198	1244
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	0.0	0.0	20.5	0.0	19.7	19.8	10.3	10.2	22.1	15.7	15.8
Incr Delay (d2), s/veh	6.1	0.0	0.0	0.5	0.0	0.7	1.9	0.1	0.1	0.4	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.7	0.0	1.6	2.8	1.6	1.1	0.4	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	0.0	0.0	21.0	0.0	20.4	21.7	10.4	10.2	22.5	16.4	16.4
LnGrp LOS	C	A	A	C	A	C	C	B	B	C	B	B
Approach Vol, veh/h	24		708				1270			794		
Approach Delay, s/veh	30.8		20.8				12.8			16.6		
Approach LOS	C		C				B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	25.4	11.9	5.8	13.8	19.6	5.2	12.5				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	47.4	12.0	29.1	17.0	34.4	5.0	36.1				
Max Q Clear Time (g_c+13), s	4.0	7.7	7.3	0.0	9.8	11.7	2.7	6.5				
Green Ext Time (p_c), s	0.0	3.4	0.6	0.0	0.2	2.6	0.0	0.5				

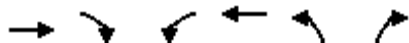
### Intersection Summary

HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	250	751	60	300	342	180
Future Volume (veh/h)	250	751	60	300	342	180
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1366	1366	1856	1856
Adj Flow Rate, veh/h	269	261	65	323	368	39
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	36	36	3	3
Cap, veh/h	1083	478	223	729	633	290
Arrive On Green	0.30	0.30	0.09	0.53	0.18	0.18
Sat Flow, veh/h	3647	1567	2525	1366	3428	1572
Grp Volume(v), veh/h	269	261	65	323	368	39
Grp Sat Flow(s), veh/h/ln	1777	1567	1262	1366	1714	1572
Q Serve(g_s), s	1.6	3.9	0.7	4.1	2.8	0.6
Cycle Q Clear(g_c), s	1.6	3.9	0.7	4.1	2.8	0.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1083	478	223	729	633	290
V/C Ratio(X)	0.25	0.55	0.29	0.44	0.58	0.13
Avail Cap(c_a), veh/h	6753	2977	498	3058	2220	1018
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.4	8.2	12.1	4.0	10.6	9.7
Incr Delay (d2), s/veh	0.0	0.4	0.7	0.2	0.3	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.3	0.6	0.1	0.1	0.8	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	7.5	8.6	12.8	4.2	10.9	9.8
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	530			388	407	
Approach Delay, s/veh	8.0			5.6	10.8	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		9.2	6.5	12.7		19.2
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		18.4	5.1	53.4		63.0
Max Q Clear Time (g_c+I1), s		4.8	2.7	5.9		6.1
Green Ext Time (p_c), s		0.7	0.0	1.4		1.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			8.2			
HCM 6th LOS			A			

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HCM 6th Edition methodology does not support Non-NEMA phasing.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Near Term Plus Phase 1 AM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↱	↰	↱		↰	↱	↱
Traffic Volume (veh/h)	30	20	20	200	30	240	20	1356	120	170	879	20
Future Volume (veh/h)	30	20	20	200	30	240	20	1356	120	170	879	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	23	0	227	34	13	23	1541	133	193	999	23
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	1	1	1	2	2	2	2	2	2
Cap, veh/h	67	46	98	281	296	250	34	1766	151	268	2100	48
Arrive On Green	0.06	0.06	0.00	0.16	0.16	0.16	0.02	0.53	0.53	0.08	0.59	0.59
Sat Flow, veh/h	1075	727	1572	1795	1885	1595	1781	3312	284	3456	3549	82
Grp Volume(v), veh/h	57	0	0	227	34	13	23	821	853	193	500	522
Grp Sat Flow(s), veh/h/ln	1802	0	1572	1795	1885	1595	1781	1777	1818	1728	1777	1854
Q Serve(g_s), s	2.9	0.0	0.0	11.5	1.5	0.7	1.2	37.8	38.9	5.1	15.1	15.1
Cycle Q Clear(g_c), s	2.9	0.0	0.0	11.5	1.5	0.7	1.2	37.8	38.9	5.1	15.1	15.1
Prop In Lane	0.60		1.00	1.00		1.00	1.00		0.16	1.00		0.04
Lane Grp Cap(c), veh/h	113	0	98	281	296	250	34	948	970	268	1051	1097
V/C Ratio(X)	0.51	0.00	0.00	0.81	0.12	0.05	0.67	0.87	0.88	0.72	0.48	0.48
Avail Cap(c_a), veh/h	669	0	584	724	760	643	302	1413	1446	586	1413	1474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	0.0	0.0	38.4	34.1	33.8	45.9	19.1	19.4	42.5	10.9	10.9
Incr Delay (d2), s/veh	1.3	0.0	0.0	2.1	0.1	0.0	8.2	2.7	3.1	1.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	5.0	0.6	0.2	0.6	14.0	14.8	2.2	5.5	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.1	0.0	0.0	40.5	34.2	33.8	54.2	21.8	22.5	43.8	11.1	11.1
LnGrp LOS	D	A	A	D	C	C	D	C	C	D	B	B
Approach Vol, veh/h	57			274			1697			1215		
Approach Delay, s/veh	44.1			39.4			22.6			16.3		
Approach LOS	D			D			C			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.3	54.3		9.9	5.8	59.8		18.8				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+I1), s	40.9			4.9	3.2	17.1		13.5				
Green Ext Time (p_c), s	0.2	8.8		0.1	0.0	5.0		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				22.0								
HCM 6th LOS				C								

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	130	70	70	140	700	70	692	20	510	874	130
Future Volume (veh/h)	150	130	70	70	140	700	70	692	20	510	874	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	169	146	25	79	157	787	79	778	21	573	982	72
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	2	2	2
Cap, veh/h	204	919	154	102	461	1380	187	970	26	669	1237	710
Arrive On Green	0.11	0.30	0.30	0.06	0.24	0.24	0.10	0.27	0.26	0.19	0.35	0.33
Sat Flow, veh/h	1781	3036	509	1795	1885	3195	1795	3561	96	3456	3554	1582
Grp Volume(v), veh/h	169	84	87	79	157	787	79	391	408	573	982	72
Grp Sat Flow(s),veh/h/ln	1781	1777	1768	1795	1885	1598	1795	1791	1866	1728	1777	1582
Q Serve(g_s), s	8.5	3.2	3.3	4.0	6.3	17.0	3.8	18.7	18.7	14.7	22.8	1.3
Cycle Q Clear(g_c), s	8.5	3.2	3.3	4.0	6.3	17.0	3.8	18.7	18.7	14.7	22.8	1.3
Prop In Lane	1.00		0.29	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	204	538	535	102	461	1380	187	488	508	669	1237	710
V/C Ratio(X)	0.83	0.16	0.16	0.78	0.34	0.57	0.42	0.80	0.80	0.86	0.79	0.10
Avail Cap(c_a), veh/h	447	1433	1427	196	1254	2723	215	937	977	1206	2673	1350
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.7	23.4	23.5	42.7	28.5	19.6	38.5	31.1	31.1	35.7	26.9	5.3
Incr Delay (d2), s/veh	3.2	0.0	0.1	4.7	0.2	0.1	0.6	1.2	1.1	1.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	1.3	1.3	1.8	2.7	5.7	1.6	7.6	8.0	6.2	9.4	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.9	23.5	23.6	47.4	28.7	19.8	39.1	32.2	32.2	37.0	27.4	5.3
LnGrp LOS	D	C	C	D	C	B	D	C	C	D	C	A
Approach Vol, veh/h	340		1023				878			1627		
Approach Delay, s/veh	33.2		23.3				32.9			29.8		
Approach LOS	C		C				C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.8	29.0	9.2	31.8	14.8	35.9	14.5	26.4				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	32.0	46.7	10.0	73.4	11.0	* 68	23.0	60.4				
Max Q Clear Time (g_c+11.0), s	11.0	20.7	6.0	5.3	5.8	24.8	10.5	19.0				
Green Ext Time (p_c), s	1.1	2.8	0.0	0.5	0.0	5.7	0.2	2.4				

### Intersection Summary

HCM 6th Ctrl Delay	29.1
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

The Ranch

8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	60	616	10	100	60	813	1346	10	70	819	160
Future Volume (veh/h)	170	60	616	10	100	60	813	1346	10	70	819	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	116	139	77	10	101	7	821	1360	5	71	827	144
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	2	2	2
Cap, veh/h	212	223	378	15	154	141	951	1844	804	91	1236	214
Arrive On Green	0.12	0.12	0.12	0.09	0.09	0.09	0.27	0.51	0.51	0.05	0.28	0.27
Sat Flow, veh/h	1795	1885	3195	168	1694	1552	3483	3582	1561	1781	4366	755
Grp Volume(v), veh/h	116	139	77	111	0	7	821	1360	5	71	644	327
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1862	0	1552	1742	1791	1561	1781	1702	1716
Q Serve(g_s), s	4.3	5.0	1.5	4.1	0.0	0.3	16.0	21.1	0.1	2.8	11.9	12.1
Cycle Q Clear(g_c), s	4.3	5.0	1.5	4.1	0.0	0.3	16.0	21.1	0.1	2.8	11.9	12.1
Prop In Lane	1.00		1.00	0.09		1.00	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	212	223	378	169	0	141	951	1844	804	91	963	486
V/C Ratio(X)	0.55	0.62	0.20	0.66	0.00	0.05	0.86	0.74	0.01	0.78	0.67	0.67
Avail Cap(c_a), veh/h	454	477	808	1021	0	851	1615	2819	1229	275	1626	820
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.6	29.9	28.3	31.3	0.0	29.5	24.6	13.5	8.4	33.4	22.6	22.7
Incr Delay (d2), s/veh	0.8	1.1	0.1	1.6	0.0	0.1	1.1	0.2	0.0	5.3	0.3	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	2.1	0.6	1.8	0.0	0.1	6.0	6.7	0.0	1.3	4.5	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	30.4	30.9	28.4	32.9	0.0	29.6	25.7	13.7	8.4	38.6	22.9	23.3
LnGrp LOS	C	C	C	C	A	C	C	B	A	D	C	C
Approach Vol, veh/h	332			118			2186			1042		
Approach Delay, s/veh	30.2			32.7			18.2			24.1		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	40.6		12.4	23.4	24.8		10.5				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	1.0	54.7		17.1	33.0	* 33		39.0				
Max Q Clear Time (g_c+14), s	14.8	23.1		7.0	18.0	14.1		6.1				
Green Ext Time (p_c), s	0.0	7.2		0.5	1.5	4.4		0.3				

## Intersection Summary

HCM 6th Ctrl Delay 21.4

HCM 6th LOS C

## Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.















# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	855	200	190	1265	70	334	150	180	70	180	120
Future Volume (veh/h)	50	855	200	190	1265	70	334	150	180	70	180	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	57	983	119	218	1454	27	384	172	47	80	207	117
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	74	1233	541	247	1579	688	445	614	507	102	285	161
Arrive On Green	0.04	0.34	0.34	0.14	0.44	0.44	0.13	0.33	0.33	0.06	0.25	0.24
Sat Flow, veh/h	1795	3582	1572	1795	3582	1561	3483	1885	1557	1810	1122	634
Grp Volume(v), veh/h	57	983	119	218	1454	27	384	172	47	80	0	324
Grp Sat Flow(s),veh/h/ln	1795	1791	1572	1795	1791	1561	1742	1885	1557	1810	0	1756
Q Serve(g_s), s	3.7	29.1	6.3	14.0	44.9	1.2	12.7	8.0	2.5	5.1	0.0	19.9
Cycle Q Clear(g_c), s	3.7	29.1	6.3	14.0	44.9	1.2	12.7	8.0	2.5	5.1	0.0	19.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	74	1233	541	247	1579	688	445	614	507	102	0	446
V/C Ratio(X)	0.77	0.80	0.22	0.88	0.92	0.04	0.86	0.28	0.09	0.78	0.00	0.73
Avail Cap(c_a), veh/h	138	1262	554	367	1720	750	563	764	631	169	0	592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	55.8	34.8	27.3	49.7	30.9	18.7	50.2	29.4	27.5	54.7	0.0	40.3
Incr Delay (d2), s/veh	6.3	3.3	0.1	11.4	7.8	0.0	9.1	0.1	0.0	4.9	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	12.7	2.3	6.9	19.7	0.4	5.9	3.5	0.9	2.4	0.0	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.1	38.1	27.4	61.1	38.7	18.7	59.3	29.5	27.6	59.6	0.0	42.1
LnGrp LOS	E	D	C	E	D	B	E	C	C	E	A	D
Approach Vol, veh/h	1159			1699			603			404		
Approach Delay, s/veh	38.2			41.3			48.3			45.5		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	42.2	20.2	44.4	19.0	33.8	8.8	55.8					
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	46.3	24.0	* 41	19.0	38.3	9.0	* 56					
Max Q Clear Time (g_c+11), s	10.0	16.0	31.1	14.7	21.9	5.7	46.9					
Green Ext Time (p_c), s	0.0	0.6	0.2	3.3	0.3	1.0	0.0	4.7				

### Intersection Summary

HCM 6th Ctrl Delay 41.9  
HCM 6th LOS D

### Notes













\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	680	339	255	930	290	425	318	140	340	559	20
Future Volume (veh/h)	30	680	339	255	930	290	425	318	140	340	559	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	35	791	124	297	1081	118	494	370	111	395	650	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	45	1003	424	324	2039	222	544	743	220	455	881	28
Arrive On Green	0.02	0.28	0.28	0.18	0.44	0.43	0.16	0.27	0.26	0.13	0.25	0.24
Sat Flow, veh/h	1795	3582	1514	1781	4666	509	3483	2708	800	3483	3537	114
Grp Volume(v), veh/h	35	791	124	297	788	411	494	243	238	395	329	342
Grp Sat Flow(s),veh/h/ln	1795	1791	1514	1781	1702	1770	1742	1791	1718	1742	1791	1860
Q Serve(g_s), s	2.3	24.6	7.7	19.7	20.4	20.5	16.8	13.7	14.1	13.4	20.4	20.4
Cycle Q Clear(g_c), s	2.3	24.6	7.7	19.7	20.4	20.5	16.8	13.7	14.1	13.4	20.4	20.4
Prop In Lane	1.00		1.00	1.00		0.29	1.00		0.47	1.00		0.06
Lane Grp Cap(c), veh/h	45	1003	424	324	1488	774	544	492	472	455	446	463
V/C Ratio(X)	0.78	0.79	0.29	0.92	0.53	0.53	0.91	0.49	0.51	0.87	0.74	0.74
Avail Cap(c_a), veh/h	89	1130	478	399	1667	867	549	580	556	578	595	618
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	40.1	34.0	48.4	24.8	25.0	50.0	36.7	37.1	51.3	41.6	41.7
Incr Delay (d2), s/veh	10.6	2.9	0.1	20.7	0.1	0.2	18.3	0.3	0.3	9.3	2.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	10.8	2.8	10.3	7.9	8.3	8.5	5.8	5.8	6.3	8.9	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.0	43.0	34.2	69.0	24.9	25.2	68.3	37.0	37.4	60.6	43.6	43.6
LnGrp LOS	E	D	C	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h	950			1496			975			1066		
Approach Delay, s/veh	42.8			33.8			52.9			49.9		
Approach LOS	D			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	37.1	25.9	37.7	22.8	34.0	7.0	56.6				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+I1), s	15.4	16.1	21.7	26.6	18.8	22.4	4.3	22.5				
Green Ext Time (p_c), s	0.4	1.6	0.2	2.7	0.0	2.1	0.0	5.3				

### Intersection Summary












HCM 6th Ctrl Delay	43.7
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	597	70	62	1054	170	220	90	47	350	102	233
Future Volume (veh/h)	176	597	70	62	1054	170	220	90	47	350	102	233
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	198	671	25	70	1184	55	247	101	-3	393	115	150
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	178	1467	645	89	1851	572	180	551	0	407	611	267
Arrive On Green	0.10	0.41	0.41	0.05	0.36	0.36	0.10	0.15	0.00	0.12	0.17	0.17
Sat Flow, veh/h	1781	3554	1562	1781	5106	1578	1795	3676	0	3483	3582	1564
Grp Volume(v), veh/h	198	671	25	70	1184	55	247	98	0	393	115	150
Grp Sat Flow(s),veh/h/ln	1781	1777	1562	1781	1702	1578	1795	1791	0	1742	1791	1564
Q Serve(g_s), s	6.0	8.2	0.6	2.3	11.5	1.4	6.0	1.4	0.0	6.7	1.7	5.3
Cycle Q Clear(g_c), s	6.0	8.2	0.6	2.3	11.5	1.4	6.0	1.4	0.0	6.7	1.7	5.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	178	1467	645	89	1851	572	180	551	0	407	611	267
V/C Ratio(X)	1.11	0.46	0.04	0.79	0.64	0.10	1.38	0.18	0.00	0.97	0.19	0.56
Avail Cap(c_a), veh/h	178	2744	1206	178	3942	1219	180	2670	0	407	2729	1192
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.0	12.7	10.5	28.2	15.9	12.6	27.0	22.1	0.0	26.4	21.3	22.8
Incr Delay (d2), s/veh	100.3	0.1	0.0	5.7	0.1	0.0	199.8	0.1	0.0	35.7	0.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	2.6	0.2	1.0	3.6	0.4	12.2	0.5	0.0	4.5	0.6	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	127.3	12.8	10.5	33.9	16.0	12.7	226.8	22.1	0.0	62.0	21.4	23.5
LnGrp LOS	F	B	B	C	B	B	F	C	A	E	C	C
Approach Vol, veh/h	894		1309			345			658			
Approach Delay, s/veh	38.1		16.8			168.7			46.1			
Approach LOS	D		B			F			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.2	7.0	28.8	10.0	14.2	10.0	25.7					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax),s	43.4	6.0	45.0	6.0	44.4	6.0	45.0					
Max Q Clear Time (g_c+1/3),s	3.4	4.3	10.2	8.0	7.3	8.0	13.5					
Green Ext Time (p_c), s	0.0	0.3	0.0	2.9	0.0	0.6	0.0	5.8				

### Intersection Summary

HCM 6th Ctrl Delay	45.1
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1127	490	160	1384	0	0	0	0	420	0	620
Future Volume (veh/h)	0	1127	490	160	1384	0	0	0	0	420	0	620
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1225	137	174	1504	0				457	0	645
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	1	1	0				2	2	2
Cap, veh/h	0	1629	505	214	2415	0				1576	0	701
Arrive On Green	0.00	0.32	0.32	0.11	0.47	0.00				0.44	0.00	0.44
Sat Flow, veh/h	0	5316	1596	1975	5316	0				3563	0	1585
Grp Volume(v), veh/h	0	1225	137	174	1504	0				457	0	645
Grp Sat Flow(s),veh/h/ln	0	1716	1596	987	1716	0				1781	0	1585
Q Serve(g_s), s	0.0	19.3	5.8	7.8	19.8	0.0				7.4	0.0	34.6
Cycle Q Clear(g_c), s	0.0	19.3	5.8	7.8	19.8	0.0				7.4	0.0	34.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1629	505	214	2415	0				1576	0	701
V/C Ratio(X)	0.00	0.75	0.27	0.81	0.62	0.00				0.29	0.00	0.92
Avail Cap(c_a), veh/h	0	2617	812	349	3755	0				2599	0	1157
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	27.7	23.1	39.4	18.0	0.0				16.1	0.0	23.7
Incr Delay (d2), s/veh	0.0	0.3	0.1	2.8	0.1	0.0				0.0	0.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.3	2.1	1.9	6.9	0.0				2.7	0.0	12.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	28.0	23.2	42.2	18.1	0.0				16.2	0.0	28.6
LnGrp LOS	A	C	C	D	B	A				B	A	C
Approach Vol, veh/h		1362			1678						1102	
Approach Delay, s/veh		27.5			20.6						23.4	
Approach LOS		C			C						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	3.8	32.6		44.0		46.4						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	6.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I), s	19.8	21.3		36.6		21.8						
Green Ext Time (p_c), s	0.1	5.9		2.1		8.4						

### Intersection Summary

HCM 6th Ctrl Delay	23.6
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↑	↑	↑↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1117	420	150	944	530	610	30	280	0	0	0
Future Volume (veh/h)	0	1117	420	150	944	530	610	30	280	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	0	1214	144	163	1026	304	687	0	139			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2			
Cap, veh/h	0	1986	616	208	2964	895	960	0	427			
Arrive On Green	0.00	0.39	0.39	0.12	0.58	0.58	0.27	0.00	0.27			
Sat Flow, veh/h	0	5274	1583	1781	5106	1542	3563	0	1583			
Grp Volume(v), veh/h	0	1214	144	163	1026	304	687	0	139			
Grp Sat Flow(s),veh/h/ln	0	1702	1583	1781	1702	1542	1781	0	1583			
Q Serve(g_s), s	0.0	10.2	3.3	4.7	5.6	5.5	9.3	0.0	3.7			
Cycle Q Clear(g_c), s	0.0	10.2	3.3	4.7	5.6	5.5	9.3	0.0	3.7			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	1986	616	208	2964	895	960	0	427			
V/C Ratio(X)	0.00	0.61	0.23	0.79	0.35	0.34	0.72	0.00	0.33			
Avail Cap(c_a), veh/h	0	4598	1425	368	6036	1822	3275	0	1456			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	13.1	10.9	22.9	5.9	5.8	17.6	0.0	15.6			
Incr Delay (d2), s/veh	0.0	0.1	0.1	2.5	0.0	0.1	0.4	0.0	0.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	2.9	0.9	1.9	1.1	1.0	3.1	0.0	1.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	13.2	11.0	25.4	5.9	5.9	18.0	0.0	15.8			
LnGrp LOS	A	B	B	C	A	A	B	A	B			
Approach Vol, veh/h	1358		1493			826						
Approach Delay, s/veh	12.9		8.0			17.6						
Approach LOS	B		A			B						
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), \$0.2	24.7		18.4		34.9							
Change Period (Y+Rc), s	4.0	5.3	5.3		5.3							
Max Green Setting (Gmax), s	1.0	46.7	47.7		61.7							
Max Q Clear Time (g_c+I10), s	1.0	12.2	11.3		7.6							
Green Ext Time (p_c), s	0.1	6.3	1.5		5.6							

### Intersection Summary

HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

### Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	90	10	10	60	344	10	140	10	250	100	20
Future Volume (veh/h)	40	90	10	10	60	344	10	140	10	250	100	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.95	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	48	107	7	12	71	225	12	167	5	298	119	16
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	135	451	30	134	100	316	136	566	17	363	909	120
Arrive On Green	0.08	0.26	0.26	0.08	0.26	0.26	0.08	0.16	0.13	0.20	0.29	0.26
Sat Flow, veh/h	1781	1734	113	1767	383	1212	1795	3545	106	1795	3173	419
Grp Volume(v), veh/h	48	0	114	12	0	296	12	84	88	298	66	69
Grp Sat Flow(s),veh/h/ln	1781	0	1848	1767	0	1595	1795	1791	1860	1795	1791	1801
Q Serve(g_s), s	1.4	0.0	2.6	0.3	0.0	8.9	0.3	2.2	2.2	8.4	1.4	1.5
Cycle Q Clear(g_c), s	1.4	0.0	2.6	0.3	0.0	8.9	0.3	2.2	2.2	8.4	1.4	1.5
Prop In Lane	1.00		0.06	1.00		0.76	1.00		0.06	1.00		0.23
Lane Grp Cap(c), veh/h	135	0	481	134	0	415	136	286	297	363	513	516
V/C Ratio(X)	0.36	0.00	0.24	0.09	0.00	0.71	0.09	0.29	0.30	0.82	0.13	0.13
Avail Cap(c_a), veh/h	370	0	1257	367	0	1085	712	1725	1792	712	1725	1735
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	0.0	15.4	22.8	0.0	17.8	22.8	19.6	19.7	20.2	14.0	14.1
Incr Delay (d2), s/veh	0.6	0.0	0.1	0.1	0.0	0.9	0.1	0.2	0.2	1.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.9	0.1	0.0	2.8	0.1	0.8	0.8	3.1	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.8	0.0	15.5	22.9	0.0	18.6	22.9	19.8	19.9	22.0	14.0	14.2
LnGrp LOS	C	A	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	162				308		184		433			
Approach Delay, s/veh	18.0				18.8		20.0		19.5			
Approach LOS	B				B		C		B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.4	8.0	17.8	8.0	19.2	8.0	17.8					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	11.0	36.0	21.0	49.7	11.0	36.0					
Max Q Clear Time (g_c+I10), s	4.2	2.3	4.6	2.3	3.5	3.4	10.9					
Green Ext Time (p_c), s	0.3	0.5	0.0	0.3	0.0	0.4	0.0	1.1				

## Intersection Summary

HCM 6th Ctrl Delay 19.2









HCM 6th LOS B

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	180	187	257	170	150	118	657	166	140	935	60
Future Volume (veh/h)	120	180	187	257	170	150	118	657	166	140	935	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	132	198	170	282	187	135	130	722	155	154	1027	62
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	162	221	189	313	323	233	158	961	206	184	1174	71
Arrive On Green	0.09	0.24	0.24	0.18	0.32	0.32	0.09	0.33	0.32	0.10	0.34	0.33
Sat Flow, veh/h	1795	929	798	1781	1001	722	1795	2930	629	1795	3426	207
Grp Volume(v), veh/h	132	0	368	282	0	322	130	441	436	154	537	552
Grp Sat Flow(s),veh/h/ln	1795	0	1727	1781	0	1723	1795	1791	1768	1795	1791	1842
Q Serve(g_s), s	7.4	0.0	21.1	15.9	0.0	15.9	7.3	22.5	22.5	8.6	28.8	28.8
Cycle Q Clear(g_c), s	7.4	0.0	21.1	15.9	0.0	15.9	7.3	22.5	22.5	8.6	28.8	28.8
Prop In Lane	1.00		0.46	1.00		0.42	1.00		0.36	1.00		0.11
Lane Grp Cap(c), veh/h	162	0	410	313	0	556	158	587	580	184	614	631
V/C Ratio(X)	0.81	0.00	0.90	0.90	0.00	0.58	0.82	0.75	0.75	0.84	0.87	0.88
Avail Cap(c_a), veh/h	263	0	574	348	0	657	158	666	657	211	718	738
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.7	0.0	37.8	41.3	0.0	28.8	45.8	30.6	30.9	45.0	31.6	31.6
Incr Delay (d2), s/veh	3.8	0.0	10.6	22.7	0.0	0.4	26.7	3.4	3.5	19.7	9.4	9.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	9.7	8.6	0.0	6.3	4.3	9.6	9.6	4.7	13.2	13.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.5	0.0	48.4	64.0	0.0	29.2	72.5	34.0	34.3	64.8	41.0	40.8
LnGrp LOS	D	A	D	E	A	C	E	C	C	E	D	D
Approach Vol, veh/h	500				604		1007				1243	
Approach Delay, s/veh	48.7				45.4		39.1				43.9	
Approach LOS	D				D		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.5	37.5	21.9	28.3	13.0	39.0	13.2	37.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	2.0	36.7	20.0	34.0	9.0	39.7	15.0	39.0				
Max Q Clear Time (g_c+I10), s	10.6	24.5	17.9	23.1	9.3	30.8	9.4	17.9				
Green Ext Time (p_c), s	0.0	2.7	0.1	1.0	0.0	2.9	0.1	1.1				

### Intersection Summary

HCM 6th Ctrl Delay 43.4  
HCM 6th LOS D












# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	0	20	23	0	60	1	817	43	330	1021	59
Future Volume (veh/h)	114	0	20	23	0	60	1	817	43	330	1021	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	0	1900	1870	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	124	0	-19	26	0	0	1	939	12	379	1174	62
Peak Hour Factor	0.92	0.92	0.92	0.87	0.92	0.87	0.92	0.87	0.87	0.87	0.87	0.92
Percent Heavy Veh, %	2	2	2	0	0	0	2	1	1	1	1	1
Cap, veh/h	180	0	515	76	0	0	22	1374	597	452	2157	114
Arrive On Green	0.10	0.00	0.00	0.04	0.00	0.00	0.01	0.38	0.38	0.25	0.62	0.59
Sat Flow, veh/h	1781	1870	0	1810	26		1781	3582	1556	1795	3461	183
Grp Volume(v), veh/h	124	-19	-19	26	23.9		1	939	12	379	607	629
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1810	C		1781	1791	1556	1795	1791	1852
Q Serve(g_s), s	3.1	0.0	0.0	0.6			0.0	10.0	0.2	9.1	8.8	8.9
Cycle Q Clear(g_c), s	3.1	0.0	0.0	0.6			0.0	10.0	0.2	9.1	8.8	8.9
Prop In Lane	1.00		0.00	1.00			1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	180	0	0	76			22	1374	597	452	1116	1155
V/C Ratio(X)	0.69	0.00	0.00	0.34			0.05	0.68	0.02	0.84	0.54	0.54
Avail Cap(c_a), veh/h	430	0	0	218			215	2671	1160	984	2101	2173
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	0.0	0.0	21.2			22.3	11.7	8.7	16.2	4.9	4.9
Incr Delay (d2), s/veh	4.6	0.0	0.0	2.7			0.8	0.2	0.0	1.6	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.0	0.3			0.0	2.7	0.1	3.0	1.1	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.4	0.0	0.0	23.9			23.1	12.0	8.7	17.8	5.0	5.1
LnGrp LOS	C	A	A	C			C	B	A	B	A	A
Approach Vol, veh/h	86						952			1615		
Approach Delay, s/veh	35.2						11.9			8.1		
Approach LOS	D						B			A		
Timer - Assigned Phs	1	2	3	4	5	6	7					
Phs Duration (G+Y+Rc), s	5.5	21.5	5.9	2.7	4.6	32.4	8.6					
Change Period (Y+Rc), s	4.0	5.3	4.5	4.5	4.5	5.3	4.5					
Max Green Setting (Gmax), s	25.0	32.7	5.0	39.0	5.0	52.2	10.5					
Max Q Clear Time (g_c+I1), s	11.1	12.0	2.6	0.0	2.0	10.9	5.1					
Green Ext Time (p_c), s	0.5	4.0	0.0	0.0	0.0	5.3	0.1					

### Intersection Summary

HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B












# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	0	20	90	0	350	19	361	50	420	500	34
Future Volume (veh/h)	100	0	20	90	0	350	19	361	50	420	500	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	123	0	-23	111	0	0	23	446	51	519	617	38
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	194	5	4	184	5	0	41	801	91	609	1926	119
Arrive On Green	0.11	0.00	0.00	0.10	0.00	0.00	0.02	0.25	0.21	0.34	0.56	0.53
Sat Flow, veh/h	1810	1900	1610	1795	1885	0	1810	3258	371	1795	3427	211
Grp Volume(v), veh/h	123	0	-23	111	0	0	23	246	251	519	322	333
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1795	1885	0	1810	1805	1824	1795	1791	1847
Q Serve(g_s), s	2.5	0.0	0.0	2.3	0.0	0.0	0.5	4.6	4.7	10.5	3.7	3.8
Cycle Q Clear(g_c), s	2.5	0.0	0.0	2.3	0.0	0.0	0.5	4.6	4.7	10.5	3.7	3.8
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.20	1.00		0.11
Lane Grp Cap(c), veh/h	194	5	4	184	5	0	41	444	448	609	1007	1038
V/C Ratio(X)	0.63	0.00	-5.56	0.60	0.00	0.00	0.56	0.55	0.56	0.85	0.32	0.32
Avail Cap(c_a), veh/h	469	1863	1579	318	1694	0	279	1293	1306	1429	2432	2508
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.7	0.0	0.0	16.7	0.0	0.0	18.8	12.8	13.0	12.0	4.6	4.6
Incr Delay (d2), s/veh	3.4	0.0	0.0	3.1	0.0	0.0	4.4	0.4	0.4	1.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.9	0.0	0.0	0.2	1.4	1.4	3.3	0.7	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.1	0.0	0.0	19.9	0.0	0.0	23.3	13.2	13.4	13.3	4.6	4.7
LnGrp LOS	C	A	A	B	A	A	C	B	B	B	A	A
Approach Vol, veh/h	100			111			520			1174		
Approach Delay, s/veh	24.7			19.9			13.8			8.5		
Approach LOS	C			B			B			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), \$7.2	13.6	8.0	0.2	4.9	25.9	8.2	0.0					
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0				
Max Green Setting (Gmax), s	1.0	26.6	6.4	38.2	6.0	51.6	9.6	35.0				
Max Q Clear Time (g_c+I12.5	1.0	6.7	4.3	0.0	2.5	5.8	4.5	0.0				
Green Ext Time (p_c), s	0.8	1.6	0.0	0.0	0.0	2.8	0.1	0.0				

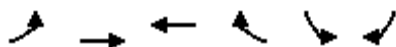
### Intersection Summary

HCM 6th Ctrl Delay	11.4
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 18: Sand Creek Road & Hillcrest Avenue

The Ranch  
Near Term Plus Phase 1 AM Peak Hour

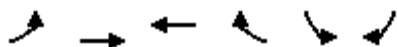







Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	60	50	84	279	10
Future Volume (veh/h)	0	60	50	84	279	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	65	54	0	303	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	496	589	589	0	503	448
Arrive On Green	0.00	0.17	0.17	0.00	0.28	0.28
Sat Flow, veh/h	1350	3647	3741	0	1781	1585
Grp Volume(v), veh/h	0	65	54	0	303	9
Grp Sat Flow(s), veh/h/ln	1350	1777	1777	0	1781	1585
Q Serve(g_s), s	0.0	0.2	0.2	0.0	2.1	0.1
Cycle Q Clear(g_c), s	0.0	0.2	0.2	0.0	2.1	0.1
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	496	589	589	0	503	448
V/C Ratio(X)	0.00	0.11	0.09	0.00	0.60	0.02
Avail Cap(c_a), veh/h	3493	8478	8478	0	4593	4087
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	5.1	5.1	0.0	4.5	3.8
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.0	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	5.2	5.2	0.0	5.7	3.8
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		65	54		312	
Approach Delay, s/veh		5.2	5.2		5.6	
Approach LOS		A	A		A	
Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			6.4		8.1	6.4
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			34.1		36.9	34.1
Max Q Clear Time (g_c+I1), s			2.2		4.1	2.2
Green Ext Time (p_c), s			0.3		0.9	0.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			5.5			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

The Ranch  
Near Term Plus Phase 1 AM Peak Hour

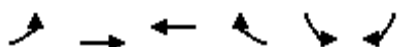


Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	0	339	124	130	200	10	
Future Volume (veh/h)	0	339	124	130	200	10	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	0	368	135	19	217	7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	3	625	552	76	1232	1096	
Arrive On Green	0.00	0.18	0.18	0.17	0.69	0.69	
Sat Flow, veh/h	1781	3647	3229	434	1781	1585	
Grp Volume(v), veh/h	0	368	76	78	217	7	
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1792	1781	1585	
Q Serve(g_s), s	0.0	5.7	2.2	2.3	2.6	0.1	
Cycle Q Clear(g_c), s	0.0	5.7	2.2	2.3	2.6	0.1	
Prop In Lane	1.00			0.24	1.00	1.00	
Lane Grp Cap(c), veh/h	3	625	313	315	1232	1096	
V/C Ratio(X)	0.00	0.59	0.24	0.25	0.18	0.01	
Avail Cap(c_a), veh/h	927	4702	1308	1319	1232	1096	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	0.0	22.8	21.4	21.5	3.3	2.9	
Incr Delay (d2), s/veh	0.0	0.9	0.4	0.4	0.3	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.0	2.2	0.8	0.9	0.5	0.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	0.0	23.7	21.8	21.9	3.6	2.9	
LnGrp LOS	A	C	C	C	A	A	
Approach Vol, veh/h		368	154		224		
Approach Delay, s/veh		23.7	21.8		3.6		
Approach LOS		C	C		A		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				14.6	45.7	0.0	14.6
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				79.3	41.2	30.9	43.9
Max Q Clear Time (g_c+I1), s				7.7	4.6	0.0	4.3
Green Ext Time (p_c), s				2.4	0.6	0.0	0.8
Intersection Summary							
HCM 6th Ctrl Delay			17.3				
HCM 6th LOS			B				

# HCM 6th Signalized Intersection Summary

## 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Near Term Plus Phase 1 AM Peak Hour










Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	234	355	171	370	810	44
Future Volume (veh/h)	234	355	171	370	810	44
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	275	418	201	134	953	21
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	560	809	809	686	1281	588
Arrive On Green	0.43	0.43	0.43	0.43	0.37	0.37
Sat Flow, veh/h	1045	1870	1870	1585	3483	1598
Grp Volume(v), veh/h	275	418	201	134	953	21
Grp Sat Flow(s), veh/h/ln	1045	1870	1870	1585	1742	1598
Q Serve(g_s), s	9.1	6.5	2.7	2.1	9.5	0.3
Cycle Q Clear(g_c), s	11.8	6.5	2.7	2.1	9.5	0.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	560	809	809	686	1281	588
V/C Ratio(X)	0.49	0.52	0.25	0.20	0.74	0.04
Avail Cap(c_a), veh/h	1568	2612	2612	2214	3128	1435
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.0	8.3	7.2	7.0	11.0	8.1
Incr Delay (d2), s/veh	0.2	0.2	0.1	0.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.5	0.6	0.4	2.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.2	8.5	7.3	7.1	11.4	8.1
LnGrp LOS	B	A	A	A	B	A
Approach Vol, veh/h		693	335		974	
Approach Delay, s/veh		9.6	7.2		11.3	
Approach LOS		A	A		B	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		21.3			21.3	18.7
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		54.7			54.7	34.7
Max Q Clear Time (g_c+I1), s		13.8			4.7	11.5
Green Ext Time (p_c), s		2.2			0.8	1.9
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			10.0			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	167	1038	0	0	377	1040	114	0	160	0	0	0
Future Volume (veh/h)	167	1038	0	0	377	1040	114	0	160	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	172	1070	0	0	389	720	118	0	87			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	341	3109	0	0	718	1217	515	0	229			
Arrive On Green	0.10	0.60	0.00	0.00	0.38	0.38	0.15	0.00	0.15			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	172	1070	0	0	389	720	118	0	87			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	1.5	3.3	0.0	0.0	5.1	5.8	0.9	0.0	1.6			
Cycle Q Clear(g_c), s	1.5	3.3	0.0	0.0	5.1	5.8	0.9	0.0	1.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	341	3109	0	0	718	1217	515	0	229			
V/C Ratio(X)	0.50	0.34	0.00	0.00	0.54	0.59	0.23	0.00	0.38			
Avail Cap(c_a), veh/h	1744	12080	0	0	3245	5500	5199	0	2313			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	13.7	3.2	0.0	0.0	7.7	7.9	12.1	0.0	12.3			
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.0	0.2	0.2	0.1	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.0	1.0	0.9	0.3	0.0	1.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.1	3.2	0.0	0.0	8.0	8.1	12.1	0.0	12.7			
LnGrp LOS	B	A	A	A	A	A	B	A	B			
Approach Vol, veh/h	1242				1109				205			
Approach Delay, s/veh	4.7				8.0				12.4			
Approach LOS	A				A				B			
Timer - Assigned Phs	2		4		5	6						
Phs Duration (G+Y+Rc), s	23.3		8.7		7.1	16.2						
Change Period (Y+Rc), s	5.3		5.3		4.0	5.3						
Max Green Setting (Gmax), s	73.7		45.7		16.0	53.7						
Max Q Clear Time (g_c+I1), s	5.3		3.6		3.5	7.8						
Green Ext Time (p_c), s	5.2		0.3		0.2	3.1						

### Intersection Summary




HCM 6th Ctrl Delay	6.8
HCM 6th LOS	A

### Notes

User approved volume balancing among the lanes for turning movement.

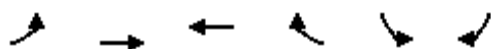
HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Near Term Plus Phase 1 AM Peak Hour

Intersection						
Int Delay, s/veh	23.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	377	43	30	425	105
Future Vol, veh/h	80	377	43	30	425	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	85	401	46	32	452	112
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1078	62	0	0	78	0
Stage 1	62	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	244	1009	-	-	1533	-
Stage 1	966	-	-	-	-	-
Stage 2	353	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	167	1009	-	-	1533	-
Mov Cap-2 Maneuver	167	-	-	-	-	-
Stage 1	966	-	-	-	-	-
Stage 2	242	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	47.2	0	6.7			
HCM LOS	E					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	536	1533	-	
HCM Lane V/C Ratio	-	-	0.907	0.295	-	
HCM Control Delay (s)	-	-	47.2	8.3	0	
HCM Lane LOS	-	-	E	A	A	
HCM 95th %tile Q(veh)	-	-	10.7	1.2	-	

# HCM 6th Signalized Intersection Summary 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↰↰↰	↱	↰	↰↰	
Traffic Volume (veh/h)	222	1265	755	80	380	790	
Future Volume (veh/h)	222	1265	755	80	380	790	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1870	1870	1796	1796	
Adj Flow Rate, veh/h	241	1375	821	0	413	538	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	1	1	2	2	7	7	
Cap, veh/h	300	1532	1553		851	1332	
Arrive On Green	0.09	0.43	0.30	0.00	0.50	0.50	
Sat Flow, veh/h	3483	3676	5274	1585	1711	2679	
Grp Volume(v), veh/h	241	1375	821	0	413	538	
Grp Sat Flow(s),veh/h/ln	1742	1791	1702	1585	1711	1340	
Q Serve(g_s), s	8.2	42.8	16.0	0.0	19.2	15.2	
Cycle Q Clear(g_c), s	8.2	42.8	16.0	0.0	19.2	15.2	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	300	1532	1553		851	1332	
V/C Ratio(X)	0.80	0.90	0.53		0.49	0.40	
Avail Cap(c_a), veh/h	421	1955	1979		851	1332	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	53.8	31.9	34.6	0.0	20.0	19.0	
Incr Delay (d2), s/veh	5.0	4.3	0.1	0.0	0.2	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.7	18.2	6.4	0.0	7.6	13.5	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	58.8	36.2	34.7	0.0	20.1	19.0	
LnGrp LOS	E	D	C		C	B	
Approach Vol, veh/h							
		1616	821	A	951		
Approach Delay, s/veh							
		39.6	34.7		19.5		
Approach LOS							
		D	C		B		
Timer - Assigned Phs							
				4	6	7	8
Phs Duration (G+Y+Rc), s				55.8	64.2	14.8	41.0
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				65.5	45.5	14.5	46.5
Max Q Clear Time (g_c+I1), s				44.8	21.2	10.2	18.0
Green Ext Time (p_c), s				6.5	1.9	0.2	3.6
Intersection Summary							
HCM 6th Ctrl Delay			32.8				
HCM 6th LOS			C				

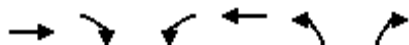
## Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary

## 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	1015	630	0	1385	110	20
Future Volume (veh/h)	1015	630	0	1385	110	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1103	385	0	1505	120	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1804	805	0	1804	1471	675
Arrive On Green	0.51	0.51	0.00	0.51	0.43	0.43
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1103	385	0	1505	120	6
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	26.6	19.0	0.0	43.4	2.5	0.3
Cycle Q Clear(g_c), s	26.6	19.0	0.0	43.4	2.5	0.3
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1804	805	0	1804	1471	675
V/C Ratio(X)	0.61	0.48	0.00	0.83	0.08	0.01
Avail Cap(c_a), veh/h	2636	1176	0	2636	1471	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	19.2	0.0	25.2	20.5	19.9
Incr Delay (d2), s/veh	0.3	0.4	0.0	1.6	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.9	7.0	0.0	17.2	1.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	21.4	19.7	0.0	26.8	20.6	19.9
LnGrp LOS	C	B	A	C	C	B
Approach Vol, veh/h	1488			1505	126	
Approach Delay, s/veh	21.0			26.8	20.6	
Approach LOS	C			C	C	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	55.1			64.9		64.9
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	22.5			88.5		88.5
Max Q Clear Time (g_c+I1), s	4.5			28.6		45.4
Green Ext Time (p_c), s	0.3			13.9		15.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			23.8			
HCM 6th LOS			C			














# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Near Term Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	207	40	89	0	40	10	35	240	0	10	110	153
Future Volume (veh/h)	207	40	89	0	40	10	35	240	0	10	110	153
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	225	43	97	0	43	11	38	261	0	11	120	166
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	280	760	644	5	194	50	104	791	353	51	685	306
Arrive On Green	0.16	0.41	0.41	0.00	0.14	0.12	0.06	0.22	0.00	0.03	0.19	0.19
Sat Flow, veh/h	1781	1870	1585	1781	1437	368	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	225	43	97	0	0	54	38	261	0	11	120	166
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1804	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.3	0.5	1.4	0.0	0.0	0.9	0.7	2.2	0.0	0.2	1.0	3.3
Cycle Q Clear(g_c), s	4.3	0.5	1.4	0.0	0.0	0.9	0.7	2.2	0.0	0.2	1.0	3.3
Prop In Lane	1.00		1.00	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	280	760	644	5	0	244	104	791	353	51	685	306
V/C Ratio(X)	0.80	0.06	0.15	0.00	0.00	0.22	0.37	0.33	0.00	0.21	0.18	0.54
Avail Cap(c_a), veh/h	280	987	837	280	0	952	280	1977	882	280	1977	882
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.3	6.3	6.6	0.0	0.0	13.6	15.9	11.4	0.0	16.6	11.8	12.8
Incr Delay (d2), s/veh	15.7	0.0	0.1	0.0	0.0	0.5	2.1	0.2	0.0	2.1	0.1	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.1	0.3	0.0	0.0	0.3	0.3	0.6	0.0	0.1	0.3	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.9	6.4	6.7	0.0	0.0	14.0	18.0	11.7	0.0	18.7	11.9	14.3
LnGrp LOS	C	A	A	A	A	B	B	B	A	B	B	B
Approach Vol, veh/h	365			54			299			297		
Approach Delay, s/veh	21.0			14.0			12.5			13.5		
Approach LOS	C			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.0	11.8	0.0	18.2	6.0	10.8	9.5	8.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+12.2), s	4.2	4.2	0.0	3.4	2.7	5.3	6.3	2.9				
Green Ext Time (p_c), s	0.0	1.2	0.0	0.4	0.0	1.0	0.0	0.2				

### Intersection Summary



















HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B



# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Near Term Plus Phase 1 PM Peak Hour








												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	200	0	240	758	783	0	0	628	440
Future Volume (veh/h)	0	0	0	200	0	240	758	783	0	0	628	440
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				204	0	75	773	799	0	0	641	135
Peak Hour Factor				0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %				1	0	1	1	1	0	0	1	1
Cap, veh/h				506	0	232	1018	2314	0	0	1617	397
Arrive On Green				0.15	0.00	0.15	0.29	0.65	0.00	0.00	0.25	0.25
Sat Flow, veh/h				3483	0	1598	3483	3676	0	0	6749	1591
Grp Volume(v), veh/h				204	0	75	773	799	0	0	641	135
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1742	1791	0	0	1621	1591
Q Serve(g_s), s				2.0	0.0	1.6	7.7	3.9	0.0	0.0	3.2	2.7
Cycle Q Clear(g_c), s				2.0	0.0	1.6	7.7	3.9	0.0	0.0	3.2	2.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				506	0	232	1018	2314	0	0	1617	397
V/C Ratio(X)				0.40	0.00	0.32	0.76	0.35	0.00	0.00	0.40	0.34
Avail Cap(c_a), veh/h				3907	0	1792	4089	8317	0	0	6768	1661
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				14.9	0.0	14.7	12.3	3.1	0.0	0.0	12.0	11.8
Incr Delay (d2), s/veh				0.2	0.0	0.3	0.4	0.0	0.0	0.0	0.1	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.6	0.0	0.5	2.0	0.1	0.0	0.0	0.8	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				15.1	0.0	15.0	12.8	3.1	0.0	0.0	12.0	12.0
LnGrp LOS				B	A	B	B	A	A	A	B	B
Approach Vol, veh/h					279			1572			776	
Approach Delay, s/veh					15.0			7.9			12.0	
Approach LOS					B			A			B	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	28.8			15.2			13.6			9.6		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	5.9			9.7			5.2			4.0		
Green Ext Time (p_c), s	3.5			1.5			2.9			0.5		
Intersection Summary												
HCM 6th Ctrl Delay	9.9											
HCM 6th LOS	A											

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								 				
Traffic Volume (veh/h)	480	0	955	0	0	0	0	1061	270	280	618	0
Future Volume (veh/h)	480	0	955	0	0	0	0	1061	270	280	618	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	500	0	995				0	1105	249	292	644	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1473	0	1311				0	1629	363	394	1636	0
Arrive On Green	0.41	0.00	0.41				0.00	0.31	0.29	0.11	0.46	0.00
Sat Flow, veh/h	3591	0	3195				0	5603	1191	3483	3676	0
Grp Volume(v), veh/h	500	0	995				0	1006	348	292	644	0
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1621	1666	1742	1791	0
Q Serve(g_s), s	6.7	0.0	18.6				0.0	12.7	12.9	5.7	8.3	0.0
Cycle Q Clear(g_c), s	6.7	0.0	18.6				0.0	12.7	12.9	5.7	8.3	0.0
Prop In Lane	1.00		1.00				0.00		0.71	1.00		0.00
Lane Grp Cap(c), veh/h	1473	0	1311				0	1484	508	394	1636	0
V/C Ratio(X)	0.34	0.00	0.76				0.00	0.68	0.69	0.74	0.39	0.00
Avail Cap(c_a), veh/h	4366	0	3885				0	2087	715	648	2408	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.1	0.0	17.7				0.0	21.3	21.8	30.0	12.6	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.9				0.0	0.2	0.6	1.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	5.9				0.0	4.2	4.6	2.2	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	0.0	18.6				0.0	21.5	22.4	31.1	12.6	0.0
LnGrp LOS	B	A	B				A	C	C	C	B	A
Approach Vol, veh/h	1495						1354			936		
Approach Delay, s/veh	17.1						21.7			18.4		
Approach LOS	B						C			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	1.9	25.3	32.7	37.2								
Change Period (Y+Rc), s	4.0	5.3	4.5	* 5.3								
Max Green Setting (Gmax), s	3.0	28.7	84.5	* 47								
Max Q Clear Time (g_c+I1), s	14.9	14.9	20.6	10.3								
Green Ext Time (p_c), s	0.3	5.0	7.5	2.7								

### Intersection Summary

HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Near Term Plus Phase 1 PM Peak Hour

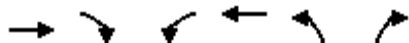


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	20	110	837	100	170	170	580	892	50	550	30
Future Volume (veh/h)	30	20	110	837	100	170	170	580	892	50	550	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	21	14	863	103	135	175	598	296	52	567	28
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	50	92	61	1143	212	277	225	1048	811	139	849	42
Arrive On Green	0.03	0.09	0.08	0.23	0.29	0.28	0.13	0.29	0.29	0.08	0.25	0.23
Sat Flow, veh/h	1781	1040	693	5023	734	963	1781	3554	2751	1781	3447	170
Grp Volume(v), veh/h	31	0	35	863	0	238	175	598	296	52	292	303
Grp Sat Flow(s),veh/h/ln	1781	0	1733	1674	0	1697	1781	1777	1376	1781	1777	1840
Q Serve(g_s), s	0.9	0.0	1.0	8.2	0.0	6.0	4.9	7.3	4.4	1.4	7.6	7.6
Cycle Q Clear(g_c), s	0.9	0.0	1.0	8.2	0.0	6.0	4.9	7.3	4.4	1.4	7.6	7.6
Prop In Lane	1.00		0.40	1.00		0.57	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	50	0	153	1143	0	489	225	1048	811	139	438	453
V/C Ratio(X)	0.63	0.00	0.23	0.75	0.00	0.49	0.78	0.57	0.36	0.38	0.67	0.67
Avail Cap(c_a), veh/h	347	0	1113	1954	0	1420	797	4632	3586	139	1659	1718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.7	0.0	21.9	18.5	0.0	15.3	21.8	15.4	14.3	22.5	17.5	17.5
Incr Delay (d2), s/veh	4.7	0.0	0.3	0.4	0.0	0.3	2.2	0.2	0.1	0.6	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.4	2.6	0.0	1.9	1.9	2.4	1.1	0.5	2.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.5	0.0	22.2	18.9	0.0	15.6	23.9	15.5	14.4	23.1	18.1	18.2
LnGrp LOS	C	A	C	B	A	B	C	B	B	C	B	B
Approach Vol, veh/h	66		1101			1069			647			
Approach Delay, s/veh	25.6		18.2			16.6			18.5			
Approach LOS	C		B			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	19.2	15.7	8.5	10.5	16.7	5.4	18.8				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	66.1	20.0	32.4	23.0	47.1	10.0	42.4				
Max Q Clear Time (g_c+I), s	13.4	9.3	10.2	3.0	6.9	9.6	2.9	8.0				
Green Ext Time (p_c), s	0.0	3.2	1.5	0.1	0.2	2.0	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			17.9									
HCM 6th LOS			B									

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	250	692	50	510	537	120
Future Volume (veh/h)	250	692	50	510	537	120
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	260	248	52	531	559	30
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	994	440	255	904	834	383
Arrive On Green	0.28	0.28	0.07	0.49	0.25	0.25
Sat Flow, veh/h	3589	1546	3401	1841	3401	1560
Grp Volume(v), veh/h	260	248	52	531	559	30
Grp Sat Flow(s), veh/h/ln	1749	1546	1700	1841	1700	1560
Q Serve(g_s), s	1.7	4.1	0.4	6.3	4.5	0.4
Cycle Q Clear(g_c), s	1.7	4.1	0.4	6.3	4.5	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	994	440	255	904	834	383
V/C Ratio(X)	0.26	0.56	0.20	0.59	0.67	0.08
Avail Cap(c_a), veh/h	4034	1783	628	2705	1950	894
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.4	9.3	13.2	5.5	10.3	8.8
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.8	0.1	0.6	1.2	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.4	9.7	13.6	5.7	10.7	8.8
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	508			583	589	
Approach Delay, s/veh	9.0			6.4	10.6	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		11.4	6.3	12.6		18.9
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		17.4	5.1	34.4		44.0
Max Q Clear Time (g_c+I1), s		6.5	2.4	6.1		8.3
Green Ext Time (p_c), s		1.0	0.0	1.4		1.9
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			8.7			
HCM 6th LOS			A			

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HCM 6th Edition methodology cannot be performed with phasing conflicts.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	↰
Traffic Volume (veh/h)	60	50	60	160	30	130	60	951	140	200	1193	30
Future Volume (veh/h)	60	50	60	160	30	130	60	951	140	200	1193	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	61	51	7	163	31	20	61	970	138	204	1217	30
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	105	87	165	244	256	217	77	1247	177	319	1590	39
Arrive On Green	0.10	0.10	0.10	0.14	0.14	0.14	0.04	0.40	0.39	0.09	0.45	0.44
Sat Flow, veh/h	1000	836	1575	1795	1885	1594	1795	3142	447	3483	3572	88
Grp Volume(v), veh/h	112	0	7	163	31	20	61	553	555	204	610	637
Grp Sat Flow(s),veh/h/ln	1835	0	1575	1795	1885	1594	1795	1791	1798	1742	1791	1869
Q Serve(g_s), s	3.4	0.0	0.2	5.1	0.9	0.6	2.0	15.9	15.9	3.3	16.9	16.9
Cycle Q Clear(g_c), s	3.4	0.0	0.2	5.1	0.9	0.6	2.0	15.9	15.9	3.3	16.9	16.9
Prop In Lane	0.54		1.00	1.00		1.00	1.00		0.25	1.00		0.05
Lane Grp Cap(c), veh/h	192	0	165	244	256	217	77	711	713	319	797	832
V/C Ratio(X)	0.58	0.00	0.04	0.67	0.12	0.09	0.79	0.78	0.78	0.64	0.76	0.77
Avail Cap(c_a), veh/h	1088	0	934	1156	1214	1026	487	2275	2284	944	2275	2374
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	0.0	23.8	24.2	22.4	22.3	28.0	15.5	15.6	25.9	13.8	13.8
Incr Delay (d2), s/veh	1.0	0.0	0.0	1.2	0.1	0.1	6.5	0.7	0.7	0.8	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.1	2.0	0.3	0.2	0.9	5.2	5.3	1.3	5.9	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	0.0	23.8	25.4	22.5	22.4	34.5	16.2	16.3	26.7	14.4	14.4
LnGrp LOS	C	A	C	C	C	C	C	B	B	C	B	B
Approach Vol, veh/h		119			214			1169			1451	
Approach Delay, s/veh		26.1			24.7			17.2			16.1	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	27.4		10.2	6.5	30.3		12.0				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	60.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+15), s	15.3	17.9		5.4	4.0	18.9		7.1				
Green Ext Time (p_c), s	0.3	4.6		0.3	0.0	6.7		0.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				17.6								
HCM 6th LOS				B								













# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	190	110	70	110	640	120	800	60	900	1031	170
Future Volume (veh/h)	170	190	110	70	110	640	120	800	60	900	1031	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	175	196	55	72	113	660	124	825	59	928	1063	100
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	205	681	186	93	344	1443	347	973	70	957	1278	726
Arrive On Green	0.11	0.24	0.24	0.05	0.18	0.18	0.19	0.29	0.28	0.27	0.36	0.35
Sat Flow, veh/h	1795	2779	760	1795	1885	3195	1795	3389	242	3483	3582	1576
Grp Volume(v), veh/h	175	124	127	72	113	660	124	436	448	928	1063	100
Grp Sat Flow(s),veh/h/ln	1795	1791	1748	1795	1885	1598	1795	1791	1840	1742	1791	1576
Q Serve(g_s), s	10.8	6.4	6.7	4.5	5.9	16.1	6.8	25.9	25.9	29.7	30.6	1.7
Cycle Q Clear(g_c), s	10.8	6.4	6.7	4.5	5.9	16.1	6.8	25.9	25.9	29.7	30.6	1.7
Prop In Lane	1.00		0.43	1.00		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	205	439	428	93	344	1443	347	514	528	957	1278	726
V/C Ratio(X)	0.85	0.28	0.30	0.78	0.33	0.46	0.36	0.85	0.85	0.97	0.83	0.14
Avail Cap(c_a), veh/h	350	1143	1116	175	1019	2588	347	794	816	957	2222	1142
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.0	34.6	34.8	52.9	40.1	21.4	39.4	37.9	38.0	40.5	33.2	6.3
Incr Delay (d2), s/veh	3.9	0.1	0.1	5.2	0.2	0.1	0.2	3.2	3.1	21.8	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	2.7	2.8	2.1	2.7	5.7	2.9	11.3	11.6	15.5	13.1	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.9	34.7	34.9	58.1	40.3	21.5	39.6	41.1	41.1	62.3	33.8	6.4
LnGrp LOS	D	C	C	E	D	C	D	D	D	E	C	A
Approach Vol, veh/h	426		845				1008		2091			
Approach Delay, s/veh	42.3		27.1				40.9		45.1			
Approach LOS	D		C				D		D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	35.0	36.4	9.8	31.6	27.1	44.2	16.9	24.6				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	31.0	48.7	11.0	71.4	11.0	* 69	22.0	60.4				
Max Q Clear Time (g_c+Q1), s	31.7	27.9	6.5	8.7	8.8	32.6	12.8	18.1				
Green Ext Time (p_c), s	0.0	3.1	0.0	0.8	0.0	6.3	0.1	1.9				

### Intersection Summary

HCM 6th Ctrl Delay 40.4  
HCM 6th LOS D

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

The Ranch

8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	80	828	10	40	60	533	921	10	60	1213	180
Future Volume (veh/h)	160	80	828	10	40	60	533	921	10	60	1213	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	126	143	86	11	42	3	561	969	6	63	1277	178
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	224	235	399	15	57	62	688	1978	861	80	1773	247
Arrive On Green	0.12	0.12	0.12	0.04	0.04	0.04	0.20	0.55	0.55	0.04	0.39	0.38
Sat Flow, veh/h	1795	1885	3195	387	1479	1598	3483	3582	1558	1795	4557	635
Grp Volume(v), veh/h	126	143	86	53	0	3	561	969	6	63	962	493
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1866	0	1598	1742	1791	1558	1795	1716	1761
Q Serve(g_s), s	4.4	4.8	1.6	1.9	0.0	0.1	10.3	11.1	0.1	2.3	15.9	15.9
Cycle Q Clear(g_c), s	4.4	4.8	1.6	1.9	0.0	0.1	10.3	11.1	0.1	2.3	15.9	15.9
Prop In Lane	1.00		1.00	0.21		1.00	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	224	235	399	72	0	62	688	1978	861	80	1335	685
V/C Ratio(X)	0.56	0.61	0.22	0.73	0.00	0.05	0.82	0.49	0.01	0.78	0.72	0.72
Avail Cap(c_a), veh/h	590	620	1051	1088	0	931	1302	2891	1258	242	1949	1000
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.6	27.7	26.3	31.8	0.0	31.0	25.7	9.2	6.7	31.6	17.3	17.4
Incr Delay (d2), s/veh	0.8	0.9	0.1	5.2	0.0	0.1	0.9	0.1	0.0	6.1	0.3	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	2.0	0.6	0.9	0.0	0.0	3.9	3.2	0.0	1.1	5.7	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	28.7	26.4	37.0	0.0	31.1	26.6	9.3	6.7	37.7	17.6	18.0
LnGrp LOS	C	C	C	D	A	C	C	A	A	D	B	B
Approach Vol, veh/h	355			56			1536			1518		
Approach Delay, s/veh	28.0			36.7			15.6			18.6		
Approach LOS	C			D			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	40.9		12.4	17.2	30.7		6.6				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	9.0	52.7		21.1	25.0	* 37		39.0				
Max Q Clear Time (g_c+14), s	14.3	13.1		6.8	12.3	17.9		3.9				
Green Ext Time (p_c), s	0.0	4.5		0.7	0.9	7.2		0.1				

## Intersection Summary

HCM 6th Ctrl Delay 18.5

HCM 6th LOS B

## Notes

User approved volume balancing among the lanes for turning movement.













\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	1301	270	110	941	40	213	60	90	50	30	80
Future Volume (veh/h)	110	1301	270	110	941	40	213	60	90	50	30	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	115	1355	214	115	980	17	222	62	22	52	31	14
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	149	1671	736	167	1707	745	324	319	268	66	138	62
Arrive On Green	0.08	0.47	0.47	0.09	0.48	0.48	0.09	0.17	0.17	0.04	0.11	0.09
Sat Flow, veh/h	1795	3582	1578	1795	3582	1563	3483	1885	1583	1795	1226	554
Grp Volume(v), veh/h	115	1355	214	115	980	17	222	62	22	52	0	45
Grp Sat Flow(s),veh/h/ln	1795	1791	1578	1795	1791	1563	1742	1885	1583	1795	0	1779
Q Serve(g_s), s	4.3	22.1	5.7	4.2	13.4	0.4	4.2	1.9	0.8	2.0	0.0	1.6
Cycle Q Clear(g_c), s	4.3	22.1	5.7	4.2	13.4	0.4	4.2	1.9	0.8	2.0	0.0	1.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	149	1671	736	167	1707	745	324	319	268	66	0	201
V/C Ratio(X)	0.77	0.81	0.29	0.69	0.57	0.02	0.68	0.19	0.08	0.79	0.00	0.22
Avail Cap(c_a), veh/h	448	2787	1228	448	2787	1216	716	1245	1046	237	0	1045
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.6	15.6	11.2	30.0	12.8	9.4	29.9	24.3	23.8	32.5	0.0	27.7
Incr Delay (d2), s/veh	3.2	0.4	0.1	1.9	0.1	0.0	1.0	0.1	0.0	7.5	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	7.2	1.6	1.8	4.3	0.1	1.7	0.8	0.3	0.9	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.8	16.0	11.3	31.9	13.0	9.4	30.9	24.4	23.9	40.1	0.0	27.9
LnGrp LOS	C	B	B	C	B	A	C	C	C	D	A	C
Approach Vol, veh/h	1684			1112			306			97		
Approach Delay, s/veh	16.6			14.9			29.1			34.4		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	15.5	10.3	35.8	10.3	11.7	9.6	36.5				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	43.7	43.7	17.0	* 53	14.0	38.7	17.0	* 53				
Max Q Clear Time (g_c+14), s	3.9	3.9	6.2	24.1	6.2	3.6	6.3	15.4				
Green Ext Time (p_c), s	0.0	0.2	0.1	7.5	0.2	0.1	0.1	4.6				

### Intersection Summary

HCM 6th Ctrl Delay	17.7
HCM 6th LOS	B

### Notes










\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	880	394	277	720	230	301	353	245	350	345	30
Future Volume (veh/h)	70	880	394	277	720	230	301	353	245	350	345	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	73	917	160	289	750	103	314	368	151	365	359	27
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	94	1150	500	324	2056	280	386	533	215	439	777	58
Arrive On Green	0.05	0.32	0.32	0.18	0.45	0.43	0.11	0.21	0.20	0.13	0.23	0.22
Sat Flow, veh/h	1810	3610	1568	1810	4616	629	3510	2496	1007	3510	3402	255
Grp Volume(v), veh/h	73	917	160	289	560	293	314	264	255	365	190	196
Grp Sat Flow(s),veh/h/ln	1810	1805	1568	1810	1729	1787	1755	1805	1698	1755	1805	1852
Q Serve(g_s), s	3.9	22.7	7.6	15.2	10.5	10.7	8.5	13.2	13.6	9.9	8.8	9.0
Cycle Q Clear(g_c), s	3.9	22.7	7.6	15.2	10.5	10.7	8.5	13.2	13.6	9.9	8.8	9.0
Prop In Lane	1.00		1.00	1.00		0.35	1.00		0.59	1.00		0.14
Lane Grp Cap(c), veh/h	94	1150	500	324	1541	796	386	385	362	439	412	423
V/C Ratio(X)	0.77	0.80	0.32	0.89	0.36	0.37	0.81	0.69	0.70	0.83	0.46	0.46
Avail Cap(c_a), veh/h	204	1552	674	463	1982	1024	503	758	713	575	795	815
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.7	30.4	25.2	39.2	17.9	18.1	42.5	35.4	35.9	41.7	32.5	32.6
Incr Delay (d2), s/veh	5.0	1.5	0.1	11.4	0.1	0.1	5.8	0.8	0.9	6.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	9.4	2.7	7.5	3.9	4.1	3.9	5.6	5.5	4.5	3.7	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.7	31.9	25.4	50.6	18.0	18.2	48.3	36.2	36.9	47.9	32.8	32.9
LnGrp LOS	D	C	C	D	B	B	D	D	D	D	C	C
Approach Vol, veh/h	1150			1142			833			751		
Approach Delay, s/veh	32.2			26.3			41.0			40.2		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.8	21.5	35.1	14.7	26.3	9.1	47.5					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	39.7	39.7	25.0	40.7	14.0	41.7	11.0	54.7				
Max Q Clear Time (g_c+I1), s	15.6	15.6	17.2	24.7	10.5	11.0	5.9	12.7				
Green Ext Time (p_c), s	0.3	1.8	0.3	3.8	0.2	1.2	0.0	3.5				

### Intersection Summary












HCM 6th Ctrl Delay	33.9
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	234	966	160	146	1056	270	150	80	55	570	155	129
Future Volume (veh/h)	234	966	160	146	1056	270	150	80	55	570	155	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	244	1006	75	152	1100	82	156	83	1	594	161	31
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	285	1292	575	189	1582	484	118	454	5	692	926	405
Arrive On Green	0.16	0.36	0.36	0.11	0.31	0.31	0.07	0.13	0.11	0.20	0.26	0.26
Sat Flow, veh/h	1795	3582	1594	1795	5147	1574	1795	3624	44	3483	3582	1566
Grp Volume(v), veh/h	244	1006	75	152	1100	82	156	41	43	594	161	31
Grp Sat Flow(s),veh/h/ln	1795	1791	1594	1795	1716	1574	1795	1791	1877	1742	1791	1566
Q Serve(g_s), s	10.1	19.0	2.4	6.3	14.4	2.9	5.0	1.6	1.6	12.6	2.7	1.1
Cycle Q Clear(g_c), s	10.1	19.0	2.4	6.3	14.4	2.9	5.0	1.6	1.6	12.6	2.7	1.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	285	1292	575	189	1582	484	118	225	235	692	926	405
V/C Ratio(X)	0.86	0.78	0.13	0.80	0.70	0.17	1.32	0.18	0.18	0.86	0.17	0.08
Avail Cap(c_a), veh/h	330	2316	1031	259	3126	956	118	1050	1100	868	2758	1206
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	21.7	16.3	33.3	23.3	19.3	35.6	29.8	29.9	29.5	21.9	21.4
Incr Delay (d2), s/veh	15.8	0.4	0.0	8.6	0.2	0.1	193.3	0.1	0.1	6.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	7.0	0.8	3.0	5.2	1.0	8.4	0.6	0.7	5.4	1.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.1	22.0	16.4	41.9	23.5	19.3	228.9	30.0	30.0	35.5	22.0	21.4
LnGrp LOS	D	C	B	D	C	B	F	C	C	D	C	C
Approach Vol, veh/h	1325		1334			240			786			
Approach Delay, s/veh	26.3		25.3			159.3			32.2			
Approach LOS	C		C			F			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	13.6	12.0	31.5	9.0	23.7	16.1	27.4				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	43.4	11.0	48.0	5.0	57.4	14.0	45.0				
Max Q Clear Time (g_c+14.6), s	14.6	3.6	8.3	21.0	7.0	4.7	12.1	16.4				
Green Ext Time (p_c), s	0.6	0.2	0.0	4.7	0.0	0.6	0.1	5.3				

### Intersection Summary

HCM 6th Ctrl Delay	35.9
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1685	680	220	1823	0	0	0	0	750	0	780
Future Volume (veh/h)	0	1685	680	220	1823	0	0	0	0	750	0	780
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1774	330	232	1919	0				789	0	794
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1704	518	227	2445	0				1706	0	759
Arrive On Green	0.00	0.33	0.33	0.11	0.47	0.00				0.47	0.00	0.47
Sat Flow, veh/h	0	5358	1578	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	1774	330	232	1919	0				789	0	794
Grp Sat Flow(s),veh/h/ln	0	1729	1578	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	46.0	24.9	16.0	43.5	0.0				20.6	0.0	66.0
Cycle Q Clear(g_c), s	0.0	46.0	24.9	16.0	43.5	0.0				20.6	0.0	66.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1704	518	227	2445	0				1706	0	759
V/C Ratio(X)	0.00	1.04	0.64	1.02	0.78	0.00				0.46	0.00	1.05
Avail Cap(c_a), veh/h	0	1704	518	227	2445	0				1706	0	759
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	47.0	39.9	62.0	31.0	0.0				25.0	0.0	37.0
Incr Delay (d2), s/veh	0.0	33.3	2.0	64.9	1.6	0.0				0.1	0.0	45.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	24.3	9.7	6.0	17.6	0.0				8.6	0.0	34.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	80.3	41.9	126.9	32.6	0.0				25.1	0.0	82.3
LnGrp LOS	A	F	D	F	C	A				C	A	F
Approach Vol, veh/h		2104			2151						1583	
Approach Delay, s/veh		74.3			42.8						53.8	
Approach LOS		E			D						D	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	30.0	50.0		70.0		70.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	60.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I1), s	110.0	48.0		68.0		45.5						
Green Ext Time (p_c), s	0.0	0.0		0.0		9.4						

### Intersection Summary

HCM 6th Ctrl Delay 57.1  
HCM 6th LOS E

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1905	530	170	1253	580	790	40	400	0	0	0
Future Volume (veh/h)	0	1905	530	170	1253	580	790	40	400	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	0	2005	361	179	1319	374	862	0	274			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	1	1	1	1	1	1	1	1			
Cap, veh/h	0	2405	735	212	3235	977	1023	0	455			
Arrive On Green	0.00	0.47	0.47	0.12	0.63	0.63	0.28	0.00	0.28			
Sat Flow, veh/h	0	5316	1572	1795	5147	1554	3591	0	1598			
Grp Volume(v), veh/h	0	2005	361	179	1319	374	862	0	274			
Grp Sat Flow(s),veh/h/ln	0	1716	1572	1795	1716	1554	1795	0	1598			
Q Serve(g_s), s	0.0	31.5	14.7	9.0	11.8	10.9	20.9	0.0	13.7			
Cycle Q Clear(g_c), s	0.0	31.5	14.7	9.0	11.8	10.9	20.9	0.0	13.7			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2405	735	212	3235	977	1023	0	455			
V/C Ratio(X)	0.00	0.83	0.49	0.84	0.41	0.38	0.84	0.00	0.60			
Avail Cap(c_a), veh/h	0	2670	816	213	3504	1058	1902	0	846			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	21.5	17.0	40.0	8.6	8.4	31.1	0.0	28.6			
Incr Delay (d2), s/veh	0.0	2.0	0.2	24.1	0.0	0.1	0.7	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	11.5	4.8	5.2	3.5	3.0	8.5	0.0	5.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.5	17.2	64.1	8.6	8.5	31.9	0.0	29.0			
LnGrp LOS	A	C	B	E	A	A	C	A	C			
Approach Vol, veh/h		2366			1872			1136				
Approach Delay, s/veh		22.5			13.9			31.2				
Approach LOS		C			B			C				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	4.9	47.2		30.4		62.2						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	46.7			47.7		61.7						
Max Q Clear Time (g_c+I1), s	33.5			22.9		13.8						
Green Ext Time (p_c), s	0.0	8.5		2.2		8.0						

## Intersection Summary

HCM 6th Ctrl Delay	21.4
HCM 6th LOS	C

## Notes

User approved volume balancing among the lanes for turning movement.











# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	50	0	10	50	163	10	60	10	200	100	40
Future Volume (veh/h)	40	50	0	10	50	163	10	60	10	200	100	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	43	54	-2	11	54	79	11	65	3	215	108	34
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	202	199	0	202	73	107	202	543	25	315	590	178
Arrive On Green	0.11	0.11	0.00	0.11	0.11	0.11	0.11	0.16	0.12	0.18	0.22	0.18
Sat Flow, veh/h	1795	1885	0	1795	691	1012	1795	3487	160	1795	2705	818
Grp Volume(v), veh/h	43	52	0	11	0	133	11	33	35	215	70	72
Grp Sat Flow(s),veh/h/ln	1795	1885	0	1795	0	1703	1795	1791	1856	1795	1791	1733
Q Serve(g_s), s	0.8	0.9	0.0	0.2	0.0	2.7	0.2	0.6	0.6	4.0	1.1	1.2
Cycle Q Clear(g_c), s	0.8	0.9	0.0	0.2	0.0	2.7	0.2	0.6	0.6	4.0	1.1	1.2
Prop In Lane	1.00		0.00	1.00		0.59	1.00		0.09	1.00		0.47
Lane Grp Cap(c), veh/h	202	199	0	202	0	179	202	279	289	315	391	378
V/C Ratio(X)	0.21	0.26	0.00	0.05	0.00	0.74	0.05	0.12	0.12	0.68	0.18	0.19
Avail Cap(c_a), veh/h	557	1913	0	557	0	1728	1063	2575	2669	1063	2575	2491
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.3	14.6	0.0	14.0	0.0	15.4	14.0	12.9	12.9	13.7	11.3	11.6
Incr Delay (d2), s/veh	0.2	0.3	0.0	0.0	0.0	2.3	0.0	0.1	0.1	1.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.0	0.1	0.0	0.9	0.1	0.2	0.2	1.2	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.5	14.9	0.0	14.1	0.0	17.7	14.1	13.0	13.0	14.7	11.4	11.7
LnGrp LOS	B	B	A	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	95			144			79			357		
Approach Delay, s/veh	14.7			17.4			13.1			13.4		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	8.0	7.7	8.0	11.7	8.0	7.7					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	11.0	36.0	21.0	49.7	11.0	36.0					
Max Q Clear Time (g_c+1/6), s	2.6	2.2	2.9	2.2	3.2	2.8	4.7					
Green Ext Time (p_c), s	0.2	0.2	0.0	0.1	0.0	0.5	0.0	0.4				

## Intersection Summary

HCM 6th Ctrl Delay	14.4
HCM 6th LOS	B











# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	110	93	142	90	90	162	648	180	290	627	90
Future Volume (veh/h)	70	110	93	142	90	90	162	648	180	290	627	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	75	118	74	153	97	62	174	697	165	312	674	88
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	97	152	95	193	208	133	219	911	216	360	1261	164
Arrive On Green	0.05	0.14	0.14	0.11	0.19	0.19	0.12	0.31	0.29	0.20	0.39	0.37
Sat Flow, veh/h	1810	1092	685	1810	1083	692	1810	2896	685	1810	3211	419
Grp Volume(v), veh/h	75	0	192	153	0	159	174	434	428	312	379	383
Grp Sat Flow(s),veh/h/ln	1810	0	1777	1810	0	1775	1810	1805	1777	1810	1805	1825
Q Serve(g_s), s	2.7	0.0	6.9	5.5	0.0	5.3	6.2	14.4	14.5	11.1	10.7	10.8
Cycle Q Clear(g_c), s	2.7	0.0	6.9	5.5	0.0	5.3	6.2	14.4	14.5	11.1	10.7	10.8
Prop In Lane	1.00		0.39	1.00		0.39	1.00		0.39	1.00		0.23
Lane Grp Cap(c), veh/h	97	0	248	193	0	342	219	568	559	360	709	717
V/C Ratio(X)	0.77	0.00	0.77	0.79	0.00	0.47	0.80	0.76	0.77	0.87	0.53	0.54
Avail Cap(c_a), veh/h	299	0	988	272	0	961	517	1085	1068	462	1031	1042
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	0.0	27.6	29.0	0.0	23.8	28.5	20.6	20.8	25.8	15.5	15.7
Incr Delay (d2), s/veh	4.9	0.0	2.0	6.6	0.0	0.4	2.5	0.8	0.8	11.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	2.8	2.5	0.0	2.0	2.6	5.3	5.3	5.3	3.7	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.9	0.0	29.6	35.6	0.0	24.2	31.0	21.4	21.7	36.8	15.8	15.9
LnGrp LOS	D	A	C	D	A	C	C	C	C	D	B	B
Approach Vol, veh/h	267					312		1036		1074		
Approach Delay, s/veh	31.4					29.8		23.1		21.9		
Approach LOS	C					C		C		C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.2	24.9	11.1	13.3	12.0	30.1	7.6	16.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	38.7	38.7	10.0	37.0	19.0	36.7	11.0	36.0				
Max Q Clear Time (g_c+I1), s	16.5	16.5	7.5	8.9	8.2	12.8	4.7	7.3				
Green Ext Time (p_c), s	0.2	3.1	0.0	0.6	0.2	2.7	0.0	0.5				

### Intersection Summary











HCM 6th Ctrl Delay	24.2
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	0	13	70	0	260	5	725	44	70	585	197
Future Volume (veh/h)	84	0	13	70	0	260	5	725	44	70	585	197
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	1870	1870	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	91	0	-14	81	0	144	5	843	13	81	680	189
Peak Hour Factor	0.92	0.92	0.92	0.86	0.92	0.86	0.92	0.86	0.86	0.86	0.86	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	0	0	0	0	0
Cap, veh/h	157	0	238	104	0	191	32	1288	562	104	1105	307
Arrive On Green	0.09	0.00	0.00	0.06	0.00	0.12	0.02	0.36	0.36	0.06	0.40	0.37
Sat Flow, veh/h	1781	1870	0	1810	0	1585	1781	3610	1574	1810	2790	775
Grp Volume(v), veh/h	91	-14	-14	81	0	144	5	843	13	81	440	429
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1810	0	1585	1781	1805	1574	1810	1805	1760
Q Serve(g_s), s	2.1	0.0	0.0	1.9	0.0	3.8	0.1	8.6	0.2	1.9	8.5	8.6
Cycle Q Clear(g_c), s	2.1	0.0	0.0	1.9	0.0	3.8	0.1	8.6	0.2	1.9	8.5	8.6
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	157	0	0	104	0	191	32	1288	562	104	715	697
V/C Ratio(X)	0.58	0.00	0.00	0.78	0.00	0.75	0.15	0.65	0.02	0.78	0.62	0.62
Avail Cap(c_a), veh/h	224	0	0	1407	0	1704	224	3344	1458	455	1899	1852
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	0.0	0.0	20.3	0.0	18.6	21.1	11.8	9.1	20.3	10.5	10.8
Incr Delay (d2), s/veh	3.4	0.0	0.0	4.6	0.0	2.3	2.2	0.2	0.0	4.8	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.8	0.0	1.2	0.1	2.4	0.1	0.8	2.3	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.5	0.0	0.0	25.0	0.0	20.9	23.3	12.0	9.1	25.1	10.9	11.1
LnGrp LOS	C	A	A	C	A	C	C	B	A	C	B	B
Approach Vol, veh/h	63			225			861			950		
Approach Delay, s/veh	32.6			22.3			12.0			12.2		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	19.6	6.5	11.1	4.8	21.3	7.8	9.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.5	4.5	5.3	4.5	* 4.5				
Max Green Setting (Gmax), s	1.0	39.2	34.0	18.0	5.0	44.7	5.0	* 47				
Max Q Clear Time (g_c+13), s	13.9	10.6	3.9	0.0	2.1	10.6	4.1	5.8				
Green Ext Time (p_c), s	0.0	3.7	0.1	0.0	0.0	3.3	0.0	0.5				

### Intersection Summary

HCM 6th Ctrl Delay 13.8

HCM 6th LOS B

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Near Term Plus Phase 1 PM Peak Hour

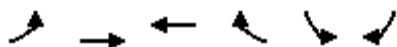


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	0	26	110	0	120	55	285	90	100	303	105
Future Volume (veh/h)	139	0	26	110	0	120	55	285	90	100	303	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	158	0	-7	125	0	24	62	324	69	114	344	88
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	404	311	264	521	0	264	101	814	171	158	872	220
Arrive On Green	0.16	0.00	0.00	0.16	0.00	0.16	0.06	0.27	0.22	0.09	0.31	0.25
Sat Flow, veh/h	1409	1900	1610	1440	0	1610	1810	2969	624	1810	2855	721
Grp Volume(v), veh/h	158	0	-7	125	0	24	62	195	198	114	216	216
Grp Sat Flow(s), veh/h/ln	1409	1900	1610	1440	0	1610	1810	1805	1788	1810	1805	1770
Q Serve(g_s), s	2.1	0.0	0.0	2.0	0.0	0.3	0.8	2.2	2.3	1.6	2.4	2.5
Cycle Q Clear(g_c), s	4.1	0.0	0.0	2.0	0.0	0.3	0.8	2.2	2.3	1.6	2.4	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.35	1.00		0.41
Lane Grp Cap(c), veh/h	404	311	264	521	0	264	101	495	490	158	551	541
V/C Ratio(X)	0.39	0.00	-0.03	0.24	0.00	0.09	0.61	0.39	0.40	0.72	0.39	0.40
Avail Cap(c_a), veh/h	2627	3309	2804	2793	0	2804	2005	3501	3467	1074	2572	2522
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.8	0.0	0.0	9.7	0.0	9.0	11.7	7.5	7.7	11.2	6.9	7.2
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	0.0	0.1	2.2	0.2	0.2	2.3	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	0.3	0.0	0.1	0.3	0.4	0.4	0.5	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	0.0	0.0	9.8	0.0	9.0	13.9	7.7	7.9	13.6	7.1	7.3
LnGrp LOS	B	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h	151			149			455			546		
Approach Delay, s/veh	12.6			9.6			8.6			8.5		
Approach LOS	B			A			A			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	10.9		8.1	5.4	11.7		8.1				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	5.0	47.7		44.0	28.0	34.7		44.0				
Max Q Clear Time (g_c+1), s	13.6	4.3		6.1	2.8	4.5		4.0				
Green Ext Time (p_c), s	0.1	1.3		0.2	0.1	1.7		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				9.2								
HCM 6th LOS				A								

# HCM 6th Signalized Intersection Summary

## 18: Sand Creek Road & Hillcrest Avenue

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	100	120	191	235	10
Future Volume (veh/h)	10	100	120	191	235	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	109	130	11	255	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	724	878	820	69	441	392
Arrive On Green	0.25	0.25	0.25	0.22	0.25	0.25
Sat Flow, veh/h	1248	3647	3413	278	1781	1585
Grp Volume(v), veh/h	11	109	69	72	255	7
Grp Sat Flow(s), veh/h/ln	1248	1777	1777	1820	1781	1585
Q Serve(g_s), s	0.1	0.4	0.5	0.5	2.0	0.1
Cycle Q Clear(g_c), s	0.6	0.4	0.5	0.5	2.0	0.1
Prop In Lane	1.00			0.15	1.00	1.00
Lane Grp Cap(c), veh/h	724	878	439	450	441	392
V/C Ratio(X)	0.02	0.12	0.16	0.16	0.58	0.02
Avail Cap(c_a), veh/h	3567	8977	3647	3736	3600	3203
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.9	4.6	4.7	4.7	5.2	4.5
Incr Delay (d2), s/veh	0.0	0.1	0.2	0.2	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.9	4.7	4.8	4.9	6.4	4.5
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		120	141		262	
Approach Delay, s/veh		4.7	4.9		6.4	
Approach LOS		A	A		A	
Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			7.9		7.9	7.9
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			39.5		31.5	32.0
Max Q Clear Time (g_c+I1), s			2.6		4.0	2.5
Green Ext Time (p_c), s			0.6		0.7	0.7
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			5.6			
HCM 6th LOS			A			

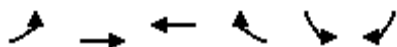
### Notes






User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

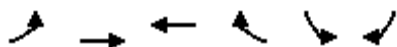
The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	315	301	120	140	10
Future Volume (veh/h)	10	315	301	120	140	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	342	327	87	152	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	38	934	508	133	1102	980
Arrive On Green	0.02	0.26	0.18	0.17	0.62	0.62
Sat Flow, veh/h	1781	3647	2879	730	1781	1585
Grp Volume(v), veh/h	11	342	207	207	152	7
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1739	1781	1585
Q Serve(g_s), s	0.4	5.3	7.3	7.5	2.4	0.1
Cycle Q Clear(g_c), s	0.4	5.3	7.3	7.5	2.4	0.1
Prop In Lane	1.00			0.42	1.00	1.00
Lane Grp Cap(c), veh/h	38	934	324	317	1102	980
V/C Ratio(X)	0.29	0.37	0.64	0.65	0.14	0.01
Avail Cap(c_a), veh/h	830	4206	1170	1145	1102	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	20.3	25.5	25.7	5.4	4.9
Incr Delay (d2), s/veh	4.2	0.2	2.1	2.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.0	2.9	3.0	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	36.7	20.5	27.6	28.0	5.6	4.9
LnGrp LOS	D	C	C	C	A	A
Approach Vol, veh/h		353	414		159	
Approach Delay, s/veh		21.0	27.8		5.6	
Approach LOS		C	C		A	
Timer - Assigned Phs						
			4		6	7 8
Phs Duration (G+Y+Rc), s			21.7		45.7	5.4 16.3
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			79.3		41.2	30.9 43.9
Max Q Clear Time (g_c+I1), s			7.3		4.4	2.4 9.5
Green Ext Time (p_c), s			2.2		0.4	0.0 2.3
Intersection Summary						
HCM 6th Ctrl Delay			21.4			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	189	325	435	190	1420	126
Future Volume (veh/h)	189	325	435	190	1420	126
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	205	353	473	60	1543	135
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	210	552	552	468	1862	854
Arrive On Green	0.29	0.29	0.29	0.29	0.53	0.53
Sat Flow, veh/h	885	1900	1900	1610	3510	1610
Grp Volume(v), veh/h	205	353	473	60	1543	135
Grp Sat Flow(s),veh/h/ln	885	1900	1900	1610	1755	1610
Q Serve(g_s), s	2.5	7.2	10.5	1.2	16.5	1.9
Cycle Q Clear(g_c), s	13.0	7.2	10.5	1.2	16.5	1.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	210	552	552	468	1862	854
V/C Ratio(X)	0.98	0.64	0.86	0.13	0.83	0.16
Avail Cap(c_a), veh/h	210	552	552	468	6200	2844
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.1	13.8	15.0	11.7	8.8	5.4
Incr Delay (d2), s/veh	54.8	1.9	12.1	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	2.6	5.2	0.3	3.2	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	76.9	15.7	27.1	11.7	9.2	5.4
LnGrp LOS	E	B	C	B	A	A
Approach Vol, veh/h		558	533		1678	
Approach Delay, s/veh		38.2	25.3		8.9	
Approach LOS		D	C		A	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		17.0			17.0	27.7
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		11.7			11.7	77.7
Max Q Clear Time (g_c+I1), s		15.0			12.5	18.5
Green Ext Time (p_c), s		0.0			0.0	4.0

## Intersection Summary

HCM 6th Ctrl Delay 17.9  
HCM 6th LOS B

## Notes








User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	1601	0	0	333	990	292	10	260	0	0	0
Future Volume (veh/h)	154	1601	0	0	333	990	292	10	260	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	162	1685	0	0	351	607	315	0	233			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	297	2903	0	0	709	1202	856	0	381			
Arrive On Green	0.08	0.56	0.00	0.00	0.37	0.37	0.24	0.00	0.24			
Sat Flow, veh/h	3510	5358	0	0	1900	3220	3619	0	1610			
Grp Volume(v), veh/h	162	1685	0	0	351	607	315	0	233			
Grp Sat Flow(s),veh/h/ln	1755	1729	0	0	1900	1610	1810	0	1610			
Q Serve(g_s), s	1.7	8.3	0.0	0.0	5.6	5.7	2.9	0.0	5.1			
Cycle Q Clear(g_c), s	1.7	8.3	0.0	0.0	5.6	5.7	2.9	0.0	5.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	297	2903	0	0	709	1202	856	0	381			
V/C Ratio(X)	0.55	0.58	0.00	0.00	0.49	0.50	0.37	0.00	0.61			
Avail Cap(c_a), veh/h	1431	9912	0	0	2663	4513	4334	0	1928			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	17.2	5.6	0.0	0.0	9.5	9.5	12.5	0.0	13.4			
Incr Delay (d2), s/veh	0.6	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.6	1.0	0.0	0.0	1.4	1.2	0.8	0.0	0.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.8	5.7	0.0	0.0	9.7	9.6	12.6	0.0	14.0			
LnGrp LOS	B	A	A	A	A	A	B	A	B			
Approach Vol, veh/h	1847			958			548					
Approach Delay, s/veh	6.8			9.6			13.2					
Approach LOS	A			A			B					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	26.0			13.3		7.3	18.7					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	73.7			45.7		16.0	53.7					
Max Q Clear Time (g_c+I1), s	10.3			7.1		3.7	7.7					
Green Ext Time (p_c), s	10.4			0.9		0.2	2.6					

### Intersection Summary




HCM 6th Ctrl Delay	8.6
HCM 6th LOS	A

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Near Term Plus Phase 1 PM Peak Hour

Intersection						
Int Delay, s/veh	14.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	442	107	50	374	85
Future Vol, veh/h	40	442	107	50	374	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	44	486	118	55	411	93
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1061	146	0	0	173	0
Stage 1	146	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	250	906	-	-	1416	-
Stage 1	886	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	174	906	-	-	1416	-
Mov Cap-2 Maneuver	174	-	-	-	-	-
Stage 1	886	-	-	-	-	-
Stage 2	273	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	27.3	0	7			
HCM LOS	D					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	672	1416	-	
HCM Lane V/C Ratio	-	-	0.788	0.29	-	
HCM Control Delay (s)	-	-	27.3	8.6	0	
HCM Lane LOS	-	-	D	A	A	
HCM 95th %tile Q(veh)	-	-	7.8	1.2	-	



# HCM 6th Signalized Intersection Summary 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Near Term Plus Phase 1 PM Peak Hour



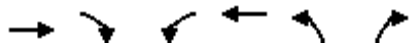
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↱↱	↰	↰	↱↱	
Traffic Volume (veh/h)	99	1309	855	30	630	610	
Future Volume (veh/h)	99	1309	855	30	630	610	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	105	1393	910	0	670	625	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	174	1536	1233		887	1530	
Arrive On Green	0.05	0.43	0.35	0.00	0.50	0.50	
Sat Flow, veh/h	3456	3647	3647	1585	1781	2790	
Grp Volume(v), veh/h	105	1393	910	0	670	625	
Grp Sat Flow(s),veh/h/ln	1728	1777	1777	1585	1781	1395	
Q Serve(g_s), s	3.4	42.1	25.8	0.0	34.8	15.0	
Cycle Q Clear(g_c), s	3.4	42.1	25.8	0.0	34.8	15.0	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	174	1536	1233		887	1530	
V/C Ratio(X)	0.60	0.91	0.74		0.76	0.41	
Avail Cap(c_a), veh/h	361	1740	1245		887	1530	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	53.5	30.5	32.9	0.0	23.2	15.1	
Incr Delay (d2), s/veh	1.2	6.3	2.0	0.0	3.3	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.5	18.0	10.9	0.0	14.9	14.5	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	54.7	36.8	35.0	0.0	26.5	15.2	
LnGrp LOS	D	D	C		C	B	
Approach Vol, veh/h		1498	910	A	1295		
Approach Delay, s/veh		38.0	35.0		21.1		
Approach LOS		D	C		C		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				53.7	61.3	9.8	43.9
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				55.8	50.2	11.5	39.8
Max Q Clear Time (g_c+I1), s				44.1	36.8	5.4	27.8
Green Ext Time (p_c), s				5.1	2.5	0.1	3.2
Intersection Summary							
HCM 6th Ctrl Delay			31.3				
HCM 6th LOS			C				

## Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Near Term Plus Phase 1 PM Peak Hour














Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	1389	580	0	1243	182	70
Future Volume (veh/h)	1389	580	0	1243	182	70
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1510	402	0	1351	198	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1912	853	0	1912	1356	622
Arrive On Green	0.54	0.54	0.00	0.54	0.39	0.39
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1510	402	0	1351	198	23
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	39.2	18.0	0.0	32.6	4.2	1.0
Cycle Q Clear(g_c), s	39.2	18.0	0.0	32.6	4.2	1.0
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1913	853	0	1913	1356	622
V/C Ratio(X)	0.79	0.47	0.00	0.71	0.15	0.04
Avail Cap(c_a), veh/h	2565	1144	0	2565	1356	622
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	16.4	0.0	19.8	22.5	21.6
Incr Delay (d2), s/veh	1.2	0.4	0.0	0.6	0.2	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	5.9	6.5	0.0	12.4	1.8	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	22.6	16.8	0.0	20.4	22.8	21.7
LnGrp LOS	C	B	A	C	C	C
Approach Vol, veh/h	1912			1351	221	
Approach Delay, s/veh	21.4			20.4	22.6	
Approach LOS	C			C	C	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	49.1			65.9		65.9
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	23.5			82.5		82.5
Max Q Clear Time (g_c+I1), s	6.2			41.2		34.6
Green Ext Time (p_c), s	0.7			20.1		12.8
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			21.1			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Near Term Plus Phase 1 PM Peak Hour




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	185	30	215	0	20	0	59	160	0	10	260	161
Future Volume (veh/h)	185	30	215	0	20	0	59	160	0	10	260	161
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	197	32	229	0	21	0	63	170	0	11	277	171
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	735	623	5	261	0	138	921	411	49	745	332
Arrive On Green	0.15	0.39	0.39	0.00	0.14	0.00	0.08	0.26	0.00	0.03	0.21	0.21
Sat Flow, veh/h	1781	1870	1585	1781	1870	0	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	197	32	229	0	21	0	63	170	0	11	277	171
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	0	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.0	0.4	3.8	0.0	0.4	0.0	1.3	1.4	0.0	0.2	2.5	3.6
Cycle Q Clear(g_c), s	4.0	0.4	3.8	0.0	0.4	0.0	1.3	1.4	0.0	0.2	2.5	3.6
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	735	623	5	261	0	138	921	411	49	745	332
V/C Ratio(X)	0.75	0.04	0.37	0.00	0.08	0.00	0.46	0.18	0.00	0.22	0.37	0.51
Avail Cap(c_a), veh/h	261	923	782	261	923	0	261	1848	824	261	1848	824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.3	7.0	8.1	0.0	14.0	0.0	16.5	10.8	0.0	17.8	12.7	13.1
Incr Delay (d2), s/veh	11.7	0.0	0.4	0.0	0.1	0.0	2.3	0.1	0.0	2.2	0.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.1	1.0	0.0	0.1	0.0	0.5	0.4	0.0	0.1	0.7	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	7.1	8.4	0.0	14.2	0.0	18.9	10.9	0.0	20.1	13.0	14.4
LnGrp LOS	C	A	A	A	B	A	B	B	A	C	B	B
Approach Vol, veh/h	458			21			233			459		
Approach Delay, s/veh	16.4			14.2			13.1			13.7		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.0	13.7	0.0	18.7	6.9	11.9	9.5	9.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+I1/2), s	12.2	3.4	0.0	5.8	3.3	5.6	6.0	2.4				
Green Ext Time (p_c), s	0.0	0.7	0.0	0.7	0.0	1.8	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	14.6											
HCM 6th LOS	B											



# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Near Term Plus Phase 2 AM Peak Hour








												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔		↗	↔↔	↕↕			↕↕↕	↗
Traffic Volume (veh/h)	0	0	0	240	0	300	1098	828	0	0	698	440
Future Volume (veh/h)	0	0	0	240	0	300	1098	828	0	0	698	440
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				282	0	221	1292	974	0	0	821	166
Peak Hour Factor				0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %				1	0	1	2	2	0	0	2	2
Cap, veh/h				660	0	303	1438	2473	0	0	1430	349
Arrive On Green				0.19	0.00	0.19	0.42	0.70	0.00	0.00	0.22	0.22
Sat Flow, veh/h				3483	0	1598	3456	3647	0	0	6696	1571
Grp Volume(v), veh/h				282	0	221	1292	974	0	0	821	166
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1728	1777	0	0	1609	1571
Q Serve(g_s), s				5.0	0.0	9.1	24.3	8.0	0.0	0.0	7.9	6.4
Cycle Q Clear(g_c), s				5.0	0.0	9.1	24.3	8.0	0.0	0.0	7.9	6.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				660	0	303	1438	2473	0	0	1430	349
V/C Ratio(X)				0.43	0.00	0.73	0.90	0.39	0.00	0.00	0.57	0.48
Avail Cap(c_a), veh/h				2147	0	985	2229	4534	0	0	3689	901
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				24.9	0.0	26.6	19.0	4.4	0.0	0.0	24.2	23.6
Incr Delay (d2), s/veh				0.2	0.0	1.3	2.4	0.0	0.0	0.0	0.1	0.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.9	0.0	3.2	8.5	1.6	0.0	0.0	2.7	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				25.1	0.0	27.9	21.4	4.5	0.0	0.0	24.3	24.0
LnGrp LOS				C	A	C	C	A	A	A	C	C
Approach Vol, veh/h					503			2266			987	
Approach Delay, s/veh					26.3			14.1			24.3	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		52.5			33.0	19.5		17.2				
Change Period (Y+Rc), s		5.3			4.0	5.3		5.3				
Max Green Setting (Gmax), s		87.7			45.0	38.7		41.7				
Max Q Clear Time (g_c+I1), s		10.0			26.3	9.9		11.1				
Green Ext Time (p_c), s		4.6			2.7	3.9		0.8				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				18.4								
HCM 6th LOS				B								

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	370	0	583	0	0	0	0	1566	200	290	668	0
Future Volume (veh/h)	370	0	583	0	0	0	0	1566	200	290	668	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1885	1885	1870	1870	0
Adj Flow Rate, veh/h	430	0	678				0	1821	214	337	777	0
Peak Hour Factor	0.86	0.86	0.86				0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3				0	1	1	2	2	0
Cap, veh/h	1031	0	917				0	2512	295	436	2081	0
Arrive On Green	0.29	0.00	0.29				0.00	0.42	0.41	0.13	0.59	0.00
Sat Flow, veh/h	3534	0	3145				0	6190	696	3456	3647	0
Grp Volume(v), veh/h	430	0	678				0	1495	540	337	777	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1621	1759	1728	1777	0
Q Serve(g_s), s	7.4	0.0	14.7				0.0	19.4	19.4	7.2	8.8	0.0
Cycle Q Clear(g_c), s	7.4	0.0	14.7				0.0	19.4	19.4	7.2	8.8	0.0
Prop In Lane	1.00		1.00				0.00		0.40	1.00		0.00
Lane Grp Cap(c), veh/h	1031	0	917				0	2062	746	436	2081	0
V/C Ratio(X)	0.42	0.00	0.74				0.00	0.72	0.72	0.77	0.37	0.00
Avail Cap(c_a), veh/h	3220	0	2865				0	2697	975	776	2956	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.6	0.0	24.2				0.0	18.1	18.4	32.1	8.3	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.2				0.0	0.4	1.1	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	5.0				0.0	6.2	7.0	2.8	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	0.0	25.4				0.0	18.6	19.5	33.2	8.4	0.0
LnGrp LOS	C	A	C				A	B	B	C	A	A
Approach Vol, veh/h	1108						2035			1114		
Approach Delay, s/veh	24.1						18.8			15.9		
Approach LOS	C						B			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), \$3.5	36.1		26.1		49.7							
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	7.0	40.7	68.5		* 63							
Max Q Clear Time (g_c+I19.2	21.4	21.4	16.7		10.8							
Green Ext Time (p_c), s	0.4	9.4	4.8		3.4							

### Intersection Summary

HCM 6th Ctrl Delay 19.4  
HCM 6th LOS B

### Notes

User approved volume balancing among the lanes for turning movement.















\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



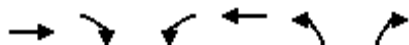
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	 		 	
Traffic Volume (veh/h)	20	0	90	463	80	110	240	490	981	30	620	30
Future Volume (veh/h)	20	0	90	463	80	110	240	490	981	30	620	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1841	1841	1841	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	24	0	0	545	94	70	282	576	412	35	729	30
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	8	8	4	4	4	2	2	2	5	5	5
Cap, veh/h	38	62	0	767	164	122	342	1488	1150	136	1035	43
Arrive On Green	0.02	0.00	0.00	0.16	0.17	0.16	0.19	0.42	0.42	0.08	0.30	0.29
Sat Flow, veh/h	1697	1781	0	4944	980	730	1781	3554	2745	1739	3395	140
Grp Volume(v), veh/h	24	0	0	545	0	164	282	576	412	35	372	387
Grp Sat Flow(s),veh/h/ln	1697	1781	0	1648	0	1709	1781	1777	1373	1739	1735	1800
Q Serve(g_s), s	0.7	0.0	0.0	5.3	0.0	4.5	7.8	5.7	5.2	1.0	9.7	9.7
Cycle Q Clear(g_c), s	0.7	0.0	0.0	5.3	0.0	4.5	7.8	5.7	5.2	1.0	9.7	9.7
Prop In Lane	1.00		0.00	1.00		0.43	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	38	62	0	767	0	286	342	1488	1150	136	529	549
V/C Ratio(X)	0.63	0.00	0.00	0.71	0.00	0.57	0.82	0.39	0.36	0.26	0.70	0.70
Avail Cap(c_a), veh/h	166	1036	0	1161	0	1228	593	3359	2595	136	1198	1244
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	0.0	0.0	20.5	0.0	19.7	19.8	10.3	10.2	22.1	15.7	15.8
Incr Delay (d2), s/veh	6.1	0.0	0.0	0.5	0.0	0.7	1.9	0.1	0.1	0.4	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.8	0.0	1.6	2.8	1.6	1.1	0.4	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	0.0	0.0	21.0	0.0	20.4	21.7	10.4	10.2	22.5	16.4	16.4
LnGrp LOS	C	A	A	C	A	C	C	B	B	C	B	B
Approach Vol, veh/h	24			709			1270			794		
Approach Delay, s/veh	30.8			20.8			12.8			16.6		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	25.4	11.9	5.8	13.8	19.6	5.2	12.5				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	47.4	12.0	29.1	17.0	34.4	5.0	36.1				
Max Q Clear Time (g_c+13), s	4.0	7.7	7.3	0.0	9.8	11.7	2.7	6.5				
Green Ext Time (p_c), s	0.0	3.4	0.6	0.0	0.2	2.6	0.0	0.5				

### Intersection Summary

HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	250	751	60	300	343	180
Future Volume (veh/h)	250	751	60	300	343	180
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1366	1366	1856	1856
Adj Flow Rate, veh/h	269	261	65	323	369	39
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	36	36	3	3
Cap, veh/h	1083	478	223	729	634	291
Arrive On Green	0.30	0.30	0.09	0.53	0.18	0.18
Sat Flow, veh/h	3647	1567	2525	1366	3428	1572
Grp Volume(v), veh/h	269	261	65	323	369	39
Grp Sat Flow(s), veh/h/ln	1777	1567	1262	1366	1714	1572
Q Serve(g_s), s	1.6	4.0	0.7	4.1	2.8	0.6
Cycle Q Clear(g_c), s	1.6	4.0	0.7	4.1	2.8	0.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1083	478	223	729	634	291
V/C Ratio(X)	0.25	0.55	0.29	0.44	0.58	0.13
Avail Cap(c_a), veh/h	6749	2976	497	3057	2219	1018
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.4	8.2	12.1	4.0	10.6	9.7
Incr Delay (d2), s/veh	0.0	0.4	0.7	0.2	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.6	0.1	0.1	0.8	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.5	8.6	12.9	4.2	10.9	9.8
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	530			388	408	
Approach Delay, s/veh	8.0			5.7	10.8	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		9.3	6.5	12.7		19.2
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		18.4	5.1	53.4		63.0
Max Q Clear Time (g_c+I1), s		4.8	2.7	6.0		6.1
Green Ext Time (p_c), s		0.7	0.0	1.4		1.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			8.2			
HCM 6th LOS			A			



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HCM 6th Edition methodology does not support Non-NEMA phasing.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Near Term Plus Phase 2 AM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	↰
Traffic Volume (veh/h)	30	20	20	200	30	240	20	1396	120	170	881	20
Future Volume (veh/h)	30	20	20	200	30	240	20	1396	120	170	881	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	23	0	227	34	13	23	1586	133	193	1001	23
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	1	1	1	2	2	2	2	2	2
Cap, veh/h	67	45	98	279	293	248	34	1803	150	265	2132	49
Arrive On Green	0.06	0.06	0.00	0.16	0.16	0.16	0.02	0.54	0.54	0.08	0.60	0.59
Sat Flow, veh/h	1075	727	1572	1795	1885	1595	1781	3321	276	3456	3549	82
Grp Volume(v), veh/h	57	0	0	227	34	13	23	842	877	193	501	523
Grp Sat Flow(s), veh/h/ln	1802	0	1572	1795	1885	1595	1781	1777	1820	1728	1777	1854
Q Serve(g_s), s	3.0	0.0	0.0	12.1	1.5	0.7	1.3	40.6	41.9	5.4	15.5	15.5
Cycle Q Clear(g_c), s	3.0	0.0	0.0	12.1	1.5	0.7	1.3	40.6	41.9	5.4	15.5	15.5
Prop In Lane	0.60		1.00	1.00		1.00	1.00		0.15	1.00		0.04
Lane Grp Cap(c), veh/h	113	0	98	279	293	248	34	965	988	265	1068	1114
V/C Ratio(X)	0.51	0.00	0.00	0.81	0.12	0.05	0.68	0.87	0.89	0.73	0.47	0.47
Avail Cap(c_a), veh/h	639	0	558	692	726	614	289	1351	1384	561	1351	1409
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.8	0.0	0.0	40.3	35.8	35.5	48.1	19.6	19.9	44.5	10.9	11.0
Incr Delay (d2), s/veh	1.3	0.0	0.0	2.2	0.1	0.0	8.6	3.7	4.3	1.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	5.3	0.7	0.3	0.6	15.3	16.3	2.3	5.6	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.1	0.0	0.0	42.5	35.9	35.5	56.7	23.3	24.2	46.0	11.1	11.1
LnGrp LOS	D	A	A	D	D	D	E	C	C	D	B	B
Approach Vol, veh/h	57			274			1742			1217		
Approach Delay, s/veh	46.1			41.3			24.2			16.6		
Approach LOS	D			D			C			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.6	57.6		10.2	5.9	63.3		19.3				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+11), s	4	43.9		5.0	3.3	17.5		14.1				
Green Ext Time (p_c), s	0.2	9.0		0.1	0.0	5.0		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				23.2								
HCM 6th LOS				C								

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	130	70	70	140	700	70	697	20	510	881	130
Future Volume (veh/h)	150	130	70	70	140	700	70	697	20	510	881	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	169	146	25	79	157	787	79	783	21	573	990	72
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	2	2	2
Cap, veh/h	204	919	154	102	461	1379	185	974	26	669	1244	713
Arrive On Green	0.11	0.30	0.30	0.06	0.24	0.24	0.10	0.27	0.26	0.19	0.35	0.34
Sat Flow, veh/h	1781	3036	509	1795	1885	3195	1795	3562	96	3456	3554	1582
Grp Volume(v), veh/h	169	84	87	79	157	787	79	394	410	573	990	72
Grp Sat Flow(s),veh/h/ln	1781	1777	1768	1795	1885	1598	1795	1791	1867	1728	1777	1582
Q Serve(g_s), s	8.5	3.2	3.3	4.0	6.3	17.1	3.8	18.9	18.9	14.8	23.1	1.3
Cycle Q Clear(g_c), s	8.5	3.2	3.3	4.0	6.3	17.1	3.8	18.9	18.9	14.8	23.1	1.3
Prop In Lane	1.00		0.29	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	204	538	535	102	461	1379	185	490	511	669	1244	713
V/C Ratio(X)	0.83	0.16	0.16	0.78	0.34	0.57	0.43	0.80	0.80	0.86	0.80	0.10
Avail Cap(c_a), veh/h	445	1427	1420	195	1248	2713	214	933	972	1200	2661	1344
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.9	23.5	23.6	42.9	28.7	19.8	38.8	31.2	31.2	35.9	27.0	5.2
Incr Delay (d2), s/veh	3.2	0.0	0.1	4.7	0.2	0.1	0.6	1.2	1.1	1.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	1.3	1.3	1.8	2.7	5.8	1.6	7.7	8.1	6.2	9.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.1	23.6	23.7	47.6	28.8	19.9	39.4	32.3	32.3	37.2	27.4	5.3
LnGrp LOS	D	C	C	D	C	B	D	C	C	D	C	A
Approach Vol, veh/h	340		1023				883			1635		
Approach Delay, s/veh	33.3		23.4				33.0			29.9		
Approach LOS	C		C				C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.8	29.2	9.2	31.9	14.8	36.3	14.6	26.5				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	32.0	46.7	10.0	73.4	11.0	* 68	23.0	60.4				
Max Q Clear Time (g_c+11.0), s	16.8	20.9	6.0	5.3	5.8	25.1	10.5	19.1				
Green Ext Time (p_c), s	1.1	2.8	0.0	0.5	0.0	5.7	0.2	2.4				

### Intersection Summary

HCM 6th Ctrl Delay	29.2
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

The Ranch

8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	60	618	10	100	60	818	1386	10	70	821	160
Future Volume (veh/h)	170	60	618	10	100	60	818	1386	10	70	821	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	116	139	79	10	101	7	826	1400	5	71	829	144
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	2	2	2
Cap, veh/h	212	223	378	15	154	141	956	1848	806	91	1236	213
Arrive On Green	0.12	0.12	0.12	0.09	0.09	0.09	0.27	0.52	0.52	0.05	0.28	0.27
Sat Flow, veh/h	1795	1885	3195	168	1694	1552	3483	3582	1561	1781	4367	753
Grp Volume(v), veh/h	116	139	79	111	0	7	826	1400	5	71	645	328
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1862	0	1552	1742	1791	1561	1781	1702	1717
Q Serve(g_s), s	4.4	5.0	1.6	4.1	0.0	0.3	16.1	22.2	0.1	2.8	12.0	12.1
Cycle Q Clear(g_c), s	4.4	5.0	1.6	4.1	0.0	0.3	16.1	22.2	0.1	2.8	12.0	12.1
Prop In Lane	1.00		1.00	0.09		1.00	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	212	223	378	169	0	141	956	1848	806	91	963	486
V/C Ratio(X)	0.55	0.62	0.21	0.66	0.00	0.05	0.86	0.76	0.01	0.78	0.67	0.68
Avail Cap(c_a), veh/h	452	475	805	1016	0	847	1608	2806	1223	274	1619	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.7	30.0	28.5	31.4	0.0	29.7	24.7	13.7	8.4	33.5	22.7	22.8
Incr Delay (d2), s/veh	0.8	1.1	0.1	1.6	0.0	0.1	1.2	0.2	0.0	5.3	0.3	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	2.2	0.6	1.8	0.0	0.1	6.0	7.0	0.0	1.3	4.6	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.5	31.1	28.6	33.0	0.0	29.7	25.9	14.0	8.4	38.8	23.0	23.5
LnGrp LOS	C	C	C	C	A	C	C	B	A	D	C	C
Approach Vol, veh/h	334			118			2231			1044		
Approach Delay, s/veh	30.3			32.8			18.4			24.2		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	40.9		12.4	23.6	24.9		10.5				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	1.0	54.7		17.1	33.0	* 33		39.0				
Max Q Clear Time (g_c+14), s	14.8	24.2		7.0	18.1	14.1		6.1				
Green Ext Time (p_c), s	0.0	7.4		0.5	1.5	4.4		0.3				

## Intersection Summary

HCM 6th Ctrl Delay 21.5

HCM 6th LOS C

## Notes

User approved volume balancing among the lanes for turning movement.













\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	859	200	190	1314	70	330	150	180	70	180	120
Future Volume (veh/h)	50	859	200	190	1314	70	330	150	180	70	180	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	57	987	119	218	1510	27	379	172	47	80	207	117
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	74	1263	554	246	1608	701	439	605	500	102	282	159
Arrive On Green	0.04	0.35	0.35	0.14	0.45	0.45	0.13	0.32	0.32	0.06	0.25	0.24
Sat Flow, veh/h	1795	3582	1572	1795	3582	1561	3483	1885	1557	1810	1122	634
Grp Volume(v), veh/h	57	987	119	218	1510	27	379	172	47	80	0	324
Grp Sat Flow(s),veh/h/ln	1795	1791	1572	1795	1791	1561	1742	1885	1557	1810	0	1755
Q Serve(g_s), s	3.8	29.7	6.4	14.4	48.4	1.2	12.9	8.2	2.5	5.3	0.0	20.4
Cycle Q Clear(g_c), s	3.8	29.7	6.4	14.4	48.4	1.2	12.9	8.2	2.5	5.3	0.0	20.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	74	1263	554	246	1608	701	439	605	500	102	0	441
V/C Ratio(X)	0.77	0.78	0.21	0.88	0.94	0.04	0.86	0.28	0.09	0.79	0.00	0.73
Avail Cap(c_a), veh/h	134	1263	554	358	1678	731	550	745	615	165	0	577
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	57.2	34.8	27.3	51.0	31.6	18.6	51.6	30.5	28.6	56.1	0.0	41.6
Incr Delay (d2), s/veh	6.3	3.0	0.1	12.7	10.3	0.0	9.7	0.1	0.0	4.9	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	12.8	2.3	7.1	21.7	0.4	6.0	3.6	0.9	2.5	0.0	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.5	37.8	27.4	63.7	41.9	18.6	61.3	30.6	28.7	61.0	0.0	43.7
LnGrp LOS	E	D	C	E	D	B	E	C	C	E	A	D
Approach Vol, veh/h	1163			1755			598			404		
Approach Delay, s/veh	38.0			44.2			49.9			47.2		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	42.7	20.5	46.5	19.2	34.3	8.9	58.0					
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	46.3	24.0	* 41	19.0	38.3	9.0	* 56					
Max Q Clear Time (g_c+11), s	10.2	16.4	31.7	14.9	22.4	5.8	50.4					
Green Ext Time (p_c), s	0.0	0.6	0.2	3.3	0.3	1.0	0.0	3.5				

### Intersection Summary

HCM 6th Ctrl Delay 43.5

HCM 6th LOS D

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	680	343	259	930	290	474	325	151	340	567	20
Future Volume (veh/h)	30	680	343	259	930	290	474	325	151	340	567	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	35	791	129	301	1081	118	551	378	124	395	659	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	45	998	422	328	2042	223	544	728	235	455	884	28
Arrive On Green	0.02	0.28	0.28	0.18	0.44	0.44	0.16	0.28	0.26	0.13	0.25	0.24
Sat Flow, veh/h	1795	3582	1514	1781	4666	509	3483	2643	854	3483	3539	113
Grp Volume(v), veh/h	35	791	129	301	788	411	551	254	248	395	333	347
Grp Sat Flow(s),veh/h/ln	1795	1791	1514	1781	1702	1770	1742	1791	1707	1742	1791	1861
Q Serve(g_s), s	2.4	24.9	8.2	20.2	20.6	20.7	19.0	14.6	15.0	13.5	20.9	20.9
Cycle Q Clear(g_c), s	2.4	24.9	8.2	20.2	20.6	20.7	19.0	14.6	15.0	13.5	20.9	20.9
Prop In Lane	1.00		1.00	1.00		0.29	1.00		0.50	1.00		0.06
Lane Grp Cap(c), veh/h	45	998	422	328	1490	775	544	493	470	455	447	465
V/C Ratio(X)	0.78	0.79	0.31	0.92	0.53	0.53	1.01	0.52	0.53	0.87	0.75	0.75
Avail Cap(c_a), veh/h	89	1119	473	395	1651	859	544	574	547	573	589	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.0	40.6	34.6	48.7	25.0	25.0	51.3	37.2	37.7	51.9	42.1	42.1
Incr Delay (d2), s/veh	10.6	3.1	0.2	21.7	0.1	0.2	41.8	0.3	0.3	9.7	2.3	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	11.0	2.9	10.7	7.9	8.3	11.2	6.2	6.2	6.4	9.2	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.6	43.7	34.8	70.5	25.1	25.2	93.1	37.5	38.0	61.5	44.4	44.4
LnGrp LOS	E	D	C	E	C	C	F	D	D	E	D	D
Approach Vol, veh/h	955			1500			1053			1075		
Approach Delay, s/veh	43.4			34.3			66.7			50.7		
Approach LOS	D			C			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), \$9.9	37.5	26.4	37.9	23.0	34.4	7.0	57.2					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+I1), s	15.5	17.0	22.2	26.9	21.0	22.9	4.4	22.7				
Green Ext Time (p_c), s	0.4	1.6	0.2	2.6	0.0	2.1	0.0	5.3				

### Intersection Summary












HCM 6th Ctrl Delay	47.5
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	178	600	70	62	1056	170	220	90	50	350	102	233
Future Volume (veh/h)	178	600	70	62	1056	170	220	90	50	350	102	233
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	200	674	25	70	1187	55	247	101	0	393	115	150
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	178	1469	645	89	1854	573	179	551	0	406	611	267
Arrive On Green	0.10	0.41	0.41	0.05	0.36	0.36	0.10	0.15	0.00	0.12	0.17	0.17
Sat Flow, veh/h	1781	3554	1562	1781	5106	1579	1795	3676	0	3483	3582	1564
Grp Volume(v), veh/h	200	674	25	70	1187	55	247	101	0	393	115	150
Grp Sat Flow(s),veh/h/ln	1781	1777	1562	1781	1702	1579	1795	1791	0	1742	1791	1564
Q Serve(g_s), s	6.0	8.2	0.6	2.3	11.6	1.4	6.0	1.5	0.0	6.7	1.7	5.3
Cycle Q Clear(g_c), s	6.0	8.2	0.6	2.3	11.6	1.4	6.0	1.5	0.0	6.7	1.7	5.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	178	1469	645	89	1854	573	179	551	0	406	611	267
V/C Ratio(X)	1.12	0.46	0.04	0.79	0.64	0.10	1.38	0.18	0.00	0.97	0.19	0.56
Avail Cap(c_a), veh/h	178	2741	1204	178	3938	1217	179	2667	0	406	2727	1191
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.0	12.8	10.5	28.2	15.9	12.6	27.0	22.1	0.0	26.4	21.3	22.8
Incr Delay (d2), s/veh	104.5	0.1	0.0	5.7	0.1	0.0	200.4	0.1	0.0	36.0	0.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	2.6	0.2	1.0	3.7	0.4	12.3	0.6	0.0	4.5	0.6	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	131.5	12.8	10.5	33.9	16.0	12.6	227.5	22.2	0.0	62.4	21.4	23.5
LnGrp LOS	F	B	B	C	B	B	F	C	A	E	C	C
Approach Vol, veh/h	899		1312			348			658			
Approach Delay, s/veh	39.2		16.8			167.9			46.4			
Approach LOS	D		B			F			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.2	7.0	28.8	10.0	14.2	10.0	25.8					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	6.0	45.0	6.0	44.4	6.0	45.0					
Max Q Clear Time (g_c+10), s	3.5	4.3	10.2	8.0	7.3	8.0	13.6					
Green Ext Time (p_c), s	0.0	0.4	0.0	2.9	0.0	0.6	0.0	5.9				

### Intersection Summary

HCM 6th Ctrl Delay	45.4
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1130	490	160	1385	0	0	0	0	420	0	620
Future Volume (veh/h)	0	1130	490	160	1385	0	0	0	0	420	0	620
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1228	137	174	1505	0				457	0	645
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	1	1	0				2	2	2
Cap, veh/h	0	1631	506	214	2416	0				1576	0	701
Arrive On Green	0.00	0.32	0.32	0.11	0.47	0.00				0.44	0.00	0.44
Sat Flow, veh/h	0	5316	1596	1975	5316	0				3563	0	1585
Grp Volume(v), veh/h	0	1228	137	174	1505	0				457	0	645
Grp Sat Flow(s),veh/h/ln	0	1716	1596	987	1716	0				1781	0	1585
Q Serve(g_s), s	0.0	19.4	5.8	7.8	19.9	0.0				7.4	0.0	34.7
Cycle Q Clear(g_c), s	0.0	19.4	5.8	7.8	19.9	0.0				7.4	0.0	34.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1631	506	214	2416	0				1576	0	701
V/C Ratio(X)	0.00	0.75	0.27	0.81	0.62	0.00				0.29	0.00	0.92
Avail Cap(c_a), veh/h	0	2611	810	349	3746	0				2593	0	1154
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	27.8	23.1	39.5	18.0	0.0				16.2	0.0	23.8
Incr Delay (d2), s/veh	0.0	0.3	0.1	2.8	0.1	0.0				0.0	0.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.4	2.1	1.9	6.9	0.0				2.8	0.0	12.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	28.0	23.2	42.3	18.1	0.0				16.2	0.0	28.7
LnGrp LOS	A	C	C	D	B	A				B	A	C
Approach Vol, veh/h		1365			1679						1102	
Approach Delay, s/veh		27.6			20.6						23.5	
Approach LOS		C			C						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	3.8	32.7		44.1		46.6						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	6.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I), s	19.8	21.4		36.7		21.9						
Green Ext Time (p_c), s	0.1	5.9		2.1		8.4						

### Intersection Summary

HCM 6th Ctrl Delay	23.7
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.



# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↑	↑	↑↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1120	420	150	945	530	610	30	280	0	0	0
Future Volume (veh/h)	0	1120	420	150	945	530	610	30	280	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	0	1217	144	163	1027	304	687	0	139			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2			
Cap, veh/h	0	1989	616	207	2966	896	959	0	426			
Arrive On Green	0.00	0.39	0.39	0.12	0.58	0.58	0.27	0.00	0.27			
Sat Flow, veh/h	0	5274	1583	1781	5106	1542	3563	0	1583			
Grp Volume(v), veh/h	0	1217	144	163	1027	304	687	0	139			
Grp Sat Flow(s),veh/h/ln	0	1702	1583	1781	1702	1542	1781	0	1583			
Q Serve(g_s), s	0.0	10.2	3.3	4.8	5.6	5.5	9.3	0.0	3.8			
Cycle Q Clear(g_c), s	0.0	10.2	3.3	4.8	5.6	5.5	9.3	0.0	3.8			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	1989	616	207	2966	896	959	0	426			
V/C Ratio(X)	0.00	0.61	0.23	0.79	0.35	0.34	0.72	0.00	0.33			
Avail Cap(c_a), veh/h	0	4591	1423	367	6026	1819	3270	0	1453			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	13.1	10.9	22.9	5.9	5.8	17.7	0.0	15.6			
Incr Delay (d2), s/veh	0.0	0.1	0.1	2.5	0.0	0.1	0.4	0.0	0.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	2.9	0.9	1.9	1.1	1.0	3.1	0.0	1.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	13.2	11.0	25.4	5.9	5.9	18.0	0.0	15.8			
LnGrp LOS	A	B	B	C	A	A	B	A	B			
Approach Vol, veh/h	1361					1494		826				
Approach Delay, s/veh	12.9					8.0		17.7				
Approach LOS	B					A		B				
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), \$0.2	24.8		18.4		35.0							
Change Period (Y+Rc), s	4.0	5.3	5.3		5.3							
Max Green Setting (Gmax), s	1.0	46.7	47.7		61.7							
Max Q Clear Time (g_c+I10), s	10.0	12.2	11.3		7.6							
Green Ext Time (p_c), s	0.1	6.3	1.5		5.6							

### Intersection Summary

HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

### Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	90	10	10	60	340	10	140	10	250	100	20
Future Volume (veh/h)	40	90	10	10	60	340	10	140	10	250	100	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.95	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	48	107	7	12	71	220	12	167	5	298	119	16
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	135	446	29	134	100	311	136	567	17	364	909	120
Arrive On Green	0.08	0.26	0.26	0.08	0.26	0.26	0.08	0.16	0.14	0.20	0.29	0.26
Sat Flow, veh/h	1781	1734	113	1767	389	1206	1795	3545	106	1795	3173	419
Grp Volume(v), veh/h	48	0	114	12	0	291	12	84	88	298	66	69
Grp Sat Flow(s),veh/h/ln	1781	0	1848	1767	0	1596	1795	1791	1860	1795	1791	1801
Q Serve(g_s), s	1.3	0.0	2.6	0.3	0.0	8.7	0.3	2.2	2.2	8.4	1.4	1.5
Cycle Q Clear(g_c), s	1.3	0.0	2.6	0.3	0.0	8.7	0.3	2.2	2.2	8.4	1.4	1.5
Prop In Lane	1.00		0.06	1.00		0.76	1.00		0.06	1.00		0.23
Lane Grp Cap(c), veh/h	135	0	476	134	0	411	136	287	298	364	513	516
V/C Ratio(X)	0.35	0.00	0.24	0.09	0.00	0.71	0.09	0.29	0.30	0.82	0.13	0.13
Avail Cap(c_a), veh/h	372	0	1264	369	0	1092	716	1735	1802	716	1735	1745
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	0.0	15.5	22.6	0.0	17.7	22.6	19.5	19.5	20.1	13.9	14.0
Incr Delay (d2), s/veh	0.6	0.0	0.1	0.1	0.0	0.8	0.1	0.2	0.2	1.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.9	0.1	0.0	2.7	0.1	0.8	0.8	3.1	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.7	0.0	15.6	22.7	0.0	18.6	22.7	19.7	19.7	21.8	13.9	14.1
LnGrp LOS	C	A	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	162				303		184		433			
Approach Delay, s/veh	18.0				18.8		19.9		19.4			
Approach LOS	B				B		B		B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.7	12.4	8.0	17.5	8.0	19.1	8.0	17.5				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	11.0	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+I10), s	10.4	4.2	2.3	4.6	2.3	3.5	3.3	10.7				
Green Ext Time (p_c), s	0.3	0.5	0.0	0.3	0.0	0.4	0.0	1.1				

## Intersection Summary









HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	180	189	270	170	150	119	729	188	140	954	60
Future Volume (veh/h)	120	180	189	270	170	150	119	729	188	140	954	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	132	198	173	297	187	135	131	801	180	154	1048	62
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	161	219	191	325	331	239	152	948	213	183	1181	70
Arrive On Green	0.09	0.24	0.24	0.18	0.33	0.33	0.08	0.33	0.31	0.10	0.34	0.33
Sat Flow, veh/h	1795	921	805	1781	1001	723	1795	2903	652	1795	3430	203
Grp Volume(v), veh/h	132	0	371	297	0	322	131	494	487	154	547	563
Grp Sat Flow(s),veh/h/ln	1795	0	1726	1781	0	1723	1795	1791	1764	1795	1791	1842
Q Serve(g_s), s	7.7	0.0	22.2	17.4	0.0	16.3	7.7	27.3	27.3	9.0	30.6	30.7
Cycle Q Clear(g_c), s	7.7	0.0	22.2	17.4	0.0	16.3	7.7	27.3	27.3	9.0	30.6	30.7
Prop In Lane	1.00		0.47	1.00		0.42	1.00		0.37	1.00		0.11
Lane Grp Cap(c), veh/h	161	0	411	325	0	570	152	585	576	183	616	634
V/C Ratio(X)	0.82	0.00	0.90	0.91	0.00	0.56	0.86	0.84	0.84	0.84	0.89	0.89
Avail Cap(c_a), veh/h	253	0	552	335	0	632	152	640	631	203	691	711
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.5	0.0	39.3	42.6	0.0	29.3	48.0	33.3	33.5	46.9	32.9	33.0
Incr Delay (d2), s/veh	5.6	0.0	12.6	27.1	0.0	0.4	35.1	8.6	8.7	22.0	11.6	11.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	10.4	9.8	0.0	6.5	4.8	12.5	12.4	5.0	14.4	14.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.1	0.0	51.9	69.7	0.0	29.7	83.1	41.9	42.3	68.8	44.5	44.3
LnGrp LOS	D	A	D	E	A	C	F	D	D	E	D	D
Approach Vol, veh/h	503		619			1112			1264			
Approach Delay, s/veh	52.3		48.9			46.9			47.4			
Approach LOS	D		D			D			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.9	38.7	23.4	29.3	13.0	40.6	13.5	39.2				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	2.0	36.7	20.0	34.0	9.0	39.7	15.0	39.0				
Max Q Clear Time (g_c+I1), s	2.0	29.3	19.4	24.2	9.7	32.7	9.7	18.3				
Green Ext Time (p_c), s	0.0	2.4	0.0	1.0	0.0	2.6	0.1	1.1				

### Intersection Summary











HCM 6th Ctrl Delay	48.2
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	0	29	23	0	60	2	864	43	330	1026	86
Future Volume (veh/h)	162	0	29	23	0	60	2	864	43	330	1026	86
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	0	1900	1870	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	176	0	-9	26	0	0	2	993	12	379	1179	91
Peak Hour Factor	0.92	0.92	0.92	0.87	0.92	0.87	0.92	0.87	0.87	0.87	0.87	0.92
Percent Heavy Veh, %	2	2	2	0	0	0	2	1	1	1	1	1
Cap, veh/h	241	0	515	72	0	0	22	1377	598	445	2088	161
Arrive On Green	0.14	0.00	0.00	0.04	0.00	0.00	0.01	0.38	0.38	0.25	0.62	0.59
Sat Flow, veh/h	1781	1870	0	1810	26		1781	3582	1556	1795	3370	260
Grp Volume(v), veh/h	176	-9	-9	26	27.1		2	993	12	379	626	644
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1810	C		1781	1791	1556	1795	1791	1838
Q Serve(g_s), s	4.9	0.0	0.0	0.7			0.1	12.2	0.2	10.4	10.5	10.6
Cycle Q Clear(g_c), s	4.9	0.0	0.0	0.7			0.1	12.2	0.2	10.4	10.5	10.6
Prop In Lane	1.00		0.00	1.00			1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	241	0	0	72			22	1377	598	445	1110	1139
V/C Ratio(X)	0.73	0.00	0.00	0.36			0.09	0.72	0.02	0.85	0.56	0.57
Avail Cap(c_a), veh/h	380	0	0	193			190	2362	1026	871	1858	1908
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.4	0.0	0.0	24.1			25.2	13.5	9.8	18.5	5.7	5.8
Incr Delay (d2), s/veh	4.2	0.0	0.0	3.0			1.7	0.3	0.0	1.8	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	0.0	0.3			0.0	3.7	0.1	3.7	1.9	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.6	0.0	0.0	27.1			26.9	13.8	9.9	20.3	5.9	6.0
LnGrp LOS	C	A	A	C			C	B	A	C	A	A
Approach Vol, veh/h	158						1007			1649		
Approach Delay, s/veh	28.5						13.8			9.2		
Approach LOS	C						B			A		
Timer - Assigned Phs	1	2	3	4	5	6	7					
Phs Duration (G+Y+Rc), \$6.8	23.8	6.1	4.9	4.6	35.9	11.0						
Change Period (Y+Rc), s	4.0	5.3	4.5	4.5	4.5	5.3	4.5					
Max Green Setting (Gmax), s	25.0	32.7	5.0	39.0	5.0	52.2	10.5					
Max Q Clear Time (g_c+I1), s	12.4	14.2	2.7	0.0	2.1	12.6	6.9					
Green Ext Time (p_c), s	0.4	4.1	0.0	0.0	0.0	5.5	0.2					

### Intersection Summary











HCM 6th Ctrl Delay	12.1
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	0	28	90	0	350	23	362	50	420	509	39
Future Volume (veh/h)	147	0	28	90	0	350	23	362	50	420	509	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	181	0	-13	111	0	0	28	447	51	519	628	44
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	255	5	4	177	4	0	48	776	88	602	1857	130
Arrive On Green	0.14	0.00	0.00	0.10	0.00	0.00	0.03	0.24	0.21	0.34	0.55	0.52
Sat Flow, veh/h	1810	1900	1610	1795	1885	0	1810	3259	370	1795	3396	238
Grp Volume(v), veh/h	181	0	-13	111	0	0	28	247	251	519	331	341
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1795	1885	0	1810	1805	1824	1795	1791	1842
Q Serve(g_s), s	4.0	0.0	0.0	2.5	0.0	0.0	0.6	5.1	5.1	11.3	4.3	4.4
Cycle Q Clear(g_c), s	4.0	0.0	0.0	2.5	0.0	0.0	0.6	5.1	5.1	11.3	4.3	4.4
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.20	1.00		0.13
Lane Grp Cap(c), veh/h	255	5	4	177	4	0	48	430	434	602	980	1008
V/C Ratio(X)	0.71	0.00	-3.39	0.63	0.00	0.00	0.58	0.57	0.58	0.86	0.34	0.34
Avail Cap(c_a), veh/h	435	1728	1464	295	1571	0	258	1199	1211	1325	2255	2320
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	0.0	18.2	0.0	0.0	20.2	14.1	14.3	13.0	5.3	5.3
Incr Delay (d2), s/veh	3.6	0.0	0.0	3.6	0.0	0.0	4.1	0.5	0.5	1.5	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0	1.0	0.0	0.0	0.3	1.6	1.6	3.8	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.9	0.0	0.0	21.9	0.0	0.0	24.3	14.6	14.7	14.5	5.4	5.4
LnGrp LOS	C	A	A	C	A	A	C	B	B	B	A	A
Approach Vol, veh/h	168			111			526			1191		
Approach Delay, s/veh	22.5			21.9			15.2			9.4		
Approach LOS	C			C			B			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	8.1	1.8	5.1	27.0	9.9	0.0					
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0				
Max Green Setting (Gmax), s	26.6	6.4	38.2	6.0	51.6	9.6	35.0					
Max Q Clear Time (g_c+I1), s	7.1	4.5	0.0	2.6	6.4	6.0	0.0					
Green Ext Time (p_c), s	0.8	1.6	0.0	0.0	0.0	2.9	0.1	0.0				

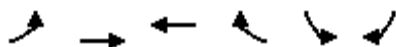
### Intersection Summary

HCM 6th Ctrl Delay	12.7
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 18: Sand Creek Road & Hillcrest Avenue

The Ranch  
Near Term Plus Phase 2 AM Peak Hour

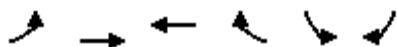







Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	60	50	96	298	10
Future Volume (veh/h)	0	60	50	96	298	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	65	54	13	324	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	475	617	497	116	531	473
Arrive On Green	0.00	0.17	0.17	0.14	0.30	0.30
Sat Flow, veh/h	1334	3647	2956	665	1781	1585
Grp Volume(v), veh/h	0	65	33	34	324	9
Grp Sat Flow(s), veh/h/ln	1334	1777	1777	1751	1781	1585
Q Serve(g_s), s	0.0	0.2	0.2	0.3	2.4	0.1
Cycle Q Clear(g_c), s	0.0	0.2	0.2	0.3	2.4	0.1
Prop In Lane	1.00			0.38	1.00	1.00
Lane Grp Cap(c), veh/h	475	617	309	304	531	473
V/C Ratio(X)	0.00	0.11	0.11	0.11	0.61	0.02
Avail Cap(c_a), veh/h	3291	8117	4058	3998	4398	3913
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	5.3	5.3	5.4	4.6	3.8
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.2	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	5.3	5.4	5.5	5.7	3.8
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		65	67		333	
Approach Delay, s/veh		5.3	5.5		5.6	
Approach LOS		A	A		A	
Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			6.6		8.5	6.6
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			34.1		36.9	34.1
Max Q Clear Time (g_c+I1), s			2.2		4.4	2.3
Green Ext Time (p_c), s			0.3		1.0	0.3
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			5.6			
HCM 6th LOS			A			

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

The Ranch  
Near Term Plus Phase 2 AM Peak Hour

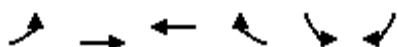


Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	0	358	136	130	200	10	
Future Volume (veh/h)	0	358	136	130	200	10	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	0	389	148	19	217	7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	3	650	581	73	1221	1087	
Arrive On Green	0.00	0.18	0.18	0.17	0.69	0.69	
Sat Flow, veh/h	1781	3647	3267	401	1781	1585	
Grp Volume(v), veh/h	0	389	82	85	217	7	
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1798	1781	1585	
Q Serve(g_s), s	0.0	6.1	2.4	2.5	2.7	0.1	
Cycle Q Clear(g_c), s	0.0	6.1	2.4	2.5	2.7	0.1	
Prop In Lane	1.00			0.22	1.00	1.00	
Lane Grp Cap(c), veh/h	3	650	325	329	1221	1087	
V/C Ratio(X)	0.00	0.60	0.25	0.26	0.18	0.01	
Avail Cap(c_a), veh/h	919	4662	1297	1312	1221	1087	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	0.0	22.8	21.3	21.4	3.4	3.0	
Incr Delay (d2), s/veh	0.0	0.9	0.4	0.4	0.3	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.0	2.3	0.9	1.0	0.5	0.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	0.0	23.7	21.7	21.8	3.7	3.0	
LnGrp LOS	A	C	C	C	A	A	
Approach Vol, veh/h		389	167		224		
Approach Delay, s/veh		23.7	21.7		3.7		
Approach LOS		C	C		A		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				15.1	45.7	0.0	15.1
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				79.3	41.2	30.9	43.9
Max Q Clear Time (g_c+I1), s				8.1	4.7	0.0	4.5
Green Ext Time (p_c), s				2.5	0.6	0.0	0.9
Intersection Summary							
HCM 6th Ctrl Delay			17.5				
HCM 6th LOS			B				

# HCM 6th Signalized Intersection Summary

## 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	241	367	175	370	810	51
Future Volume (veh/h)	241	367	175	370	810	51
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	284	432	206	134	953	29
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	561	825	825	699	1272	584
Arrive On Green	0.44	0.44	0.44	0.44	0.37	0.37
Sat Flow, veh/h	1040	1870	1870	1585	3483	1598
Grp Volume(v), veh/h	284	432	206	134	953	29
Grp Sat Flow(s), veh/h/ln	1040	1870	1870	1585	1742	1598
Q Serve(g_s), s	9.7	6.9	2.9	2.1	9.9	0.5
Cycle Q Clear(g_c), s	12.6	6.9	2.9	2.1	9.9	0.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	561	825	825	699	1272	584
V/C Ratio(X)	0.51	0.52	0.25	0.19	0.75	0.05
Avail Cap(c_a), veh/h	1514	2537	2537	2150	3037	1393
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	8.4	7.3	7.0	11.4	8.5
Incr Delay (d2), s/veh	0.3	0.2	0.1	0.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.6	0.7	0.4	2.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.5	8.6	7.3	7.1	11.8	8.5
LnGrp LOS	B	A	A	A	B	A
Approach Vol, veh/h		716	340		982	
Approach Delay, s/veh		9.7	7.2		11.7	
Approach LOS		A	A		B	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		22.2			22.2	19.1
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		54.7			54.7	34.7
Max Q Clear Time (g_c+I1), s		14.6			4.9	11.9
Green Ext Time (p_c), s		2.3			0.9	1.9
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			10.3			
HCM 6th LOS			B			



# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road




The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↑			↑↑	↰	↰	↰	↰			
Traffic Volume (veh/h)	171	1046	0	0	380	1040	115	0	160	0	0	0
Future Volume (veh/h)	171	1046	0	0	380	1040	115	0	160	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	176	1078	0	0	392	720	119	0	87			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	344	3112	0	0	718	1217	514	0	229			
Arrive On Green	0.10	0.60	0.00	0.00	0.38	0.38	0.15	0.00	0.15			
Sat Flow, veh/h	3483	5316	0	0	1885	3195	3534	0	1572			
Grp Volume(v), veh/h	176	1078	0	0	392	720	119	0	87			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	1.5	3.4	0.0	0.0	5.2	5.8	1.0	0.0	1.6			
Cycle Q Clear(g_c), s	1.5	3.4	0.0	0.0	5.2	5.8	1.0	0.0	1.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	344	3112	0	0	718	1217	514	0	229			
V/C Ratio(X)	0.51	0.35	0.00	0.00	0.55	0.59	0.23	0.00	0.38			
Avail Cap(c_a), veh/h	1741	12055	0	0	3238	5489	5188	0	2308			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	13.7	3.2	0.0	0.0	7.7	7.9	12.1	0.0	12.4			
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.0	0.2	0.2	0.1	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.0	1.0	0.9	0.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.1	3.2	0.0	0.0	8.0	8.1	12.2	0.0	12.8			
LnGrp LOS	B	A	A	A	A	A	B	A	B			
Approach Vol, veh/h												
		1254				1112				206		
		4.7				8.1				12.4		
		A				A				B		
Timer - Assigned Phs		2		4		5		6				
Phs Duration (G+Y+Rc), s		23.4		8.7		7.2		16.2				
Change Period (Y+Rc), s		5.3		5.3		4.0		5.3				
Max Green Setting (Gmax), s		73.7		45.7		16.0		53.7				
Max Q Clear Time (g_c+I1), s		5.4		3.6		3.5		7.8				
Green Ext Time (p_c), s		5.2		0.3		0.2		3.1				
Intersection Summary												
HCM 6th Ctrl Delay			6.8									
HCM 6th LOS			A									

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Near Term Plus Phase 2 AM Peak Hour

Intersection						
Int Delay, s/veh	27					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	382	43	30	440	107
Future Vol, veh/h	80	382	43	30	440	107
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	85	406	46	32	468	114
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1112	62	0	0	78	0
Stage 1	62	-	-	-	-	-
Stage 2	1050	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	233	1009	-	-	1533	-
Stage 1	966	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	157	1009	-	-	1533	-
Mov Cap-2 Maneuver	157	-	-	-	-	-
Stage 1	966	-	-	-	-	-
Stage 2	229	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	55.2	0	6.7			
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	520	1533	-	
HCM Lane V/C Ratio	-	-	0.945	0.305	-	
HCM Control Delay (s)	-	-	55.2	8.4	0	
HCM Lane LOS	-	-	F	A	A	
HCM 95th %tile Q(veh)	-	-	11.9	1.3	-	

# HCM 6th Signalized Intersection Summary 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



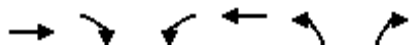
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↱	↕	↰↱↕	↰	↰	↰↱	
Traffic Volume (veh/h)	232	1267	757	80	380	790	
Future Volume (veh/h)	232	1267	757	80	380	790	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1870	1870	1796	1796	
Adj Flow Rate, veh/h	252	1377	823	0	413	538	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	1	1	2	2	7	7	
Cap, veh/h	310	1534	1540		850	1331	
Arrive On Green	0.09	0.43	0.30	0.00	0.50	0.50	
Sat Flow, veh/h	3483	3676	5274	1585	1711	2679	
Grp Volume(v), veh/h	252	1377	823	0	413	538	
Grp Sat Flow(s),veh/h/ln	1742	1791	1702	1585	1711	1340	
Q Serve(g_s), s	8.5	42.9	16.1	0.0	19.2	15.2	
Cycle Q Clear(g_c), s	8.5	42.9	16.1	0.0	19.2	15.2	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	310	1534	1540		850	1331	
V/C Ratio(X)	0.81	0.90	0.53		0.49	0.40	
Avail Cap(c_a), veh/h	421	1955	1979		850	1331	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	53.7	31.9	34.9	0.0	20.0	19.0	
Incr Delay (d2), s/veh	6.1	4.3	0.1	0.0	0.2	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.9	18.3	6.5	0.0	7.6	13.5	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	59.8	36.2	35.0	0.0	20.2	19.1	
LnGrp LOS	E	D	C		C	B	
Approach Vol, veh/h		1629	823	A	951		
Approach Delay, s/veh		39.8	35.0		19.6		
Approach LOS		D	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				55.9	64.1	15.2	40.7
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				65.5	45.5	14.5	46.5
Max Q Clear Time (g_c+I1), s				44.9	21.2	10.5	18.1
Green Ext Time (p_c), s				6.5	1.9	0.2	3.6
Intersection Summary							
HCM 6th Ctrl Delay			33.0				
HCM 6th LOS			C				

## Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Near Term Plus Phase 2 AM Peak Hour














Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	1017	630	0	1383	114	20
Future Volume (veh/h)	1017	630	0	1383	114	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1105	385	0	1503	124	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1802	804	0	1802	1473	676
Arrive On Green	0.51	0.51	0.00	0.51	0.43	0.43
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1105	385	0	1503	124	6
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	26.7	19.0	0.0	43.4	2.6	0.3
Cycle Q Clear(g_c), s	26.7	19.0	0.0	43.4	2.6	0.3
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1802	804	0	1802	1473	676
V/C Ratio(X)	0.61	0.48	0.00	0.83	0.08	0.01
Avail Cap(c_a), veh/h	2636	1176	0	2636	1473	676
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.2	19.3	0.0	25.3	20.5	19.8
Incr Delay (d2), s/veh	0.3	0.4	0.0	1.6	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.0	7.0	0.0	17.2	1.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	21.5	19.7	0.0	26.9	20.6	19.8
LnGrp LOS	C	B	A	C	C	B
Approach Vol, veh/h	1490			1503	130	
Approach Delay, s/veh	21.0			26.9	20.6	
Approach LOS	C			C	C	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	55.2			64.8		64.8
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	22.5			88.5		88.5
Max Q Clear Time (g_c+I1), s	4.6			28.7		45.4
Green Ext Time (p_c), s	0.3			13.9		15.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			23.8			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Near Term Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	210	40	108	0	40	10	42	240	0	10	110	154
Future Volume (veh/h)	210	40	108	0	40	10	42	240	0	10	110	154
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	228	43	117	0	43	11	46	261	0	11	120	167
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	276	757	642	5	198	51	117	814	363	51	683	305
Arrive On Green	0.15	0.40	0.40	0.00	0.14	0.12	0.07	0.23	0.00	0.03	0.19	0.19
Sat Flow, veh/h	1781	1870	1585	1781	1437	368	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	228	43	117	0	0	54	46	261	0	11	120	167
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1804	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.4	0.5	1.7	0.0	0.0	0.9	0.9	2.2	0.0	0.2	1.0	3.4
Cycle Q Clear(g_c), s	4.4	0.5	1.7	0.0	0.0	0.9	0.9	2.2	0.0	0.2	1.0	3.4
Prop In Lane	1.00		1.00	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	276	757	642	5	0	248	117	814	363	51	683	305
V/C Ratio(X)	0.83	0.06	0.18	0.00	0.00	0.22	0.39	0.32	0.00	0.22	0.18	0.55
Avail Cap(c_a), veh/h	276	973	825	276	0	939	276	1949	869	276	1949	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.6	6.4	6.8	0.0	0.0	13.7	15.9	11.4	0.0	16.9	12.0	13.0
Incr Delay (d2), s/veh	18.5	0.0	0.1	0.0	0.0	0.4	2.2	0.2	0.0	2.1	0.1	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.1	0.4	0.0	0.0	0.3	0.3	0.6	0.0	0.1	0.3	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	6.5	6.9	0.0	0.0	14.1	18.1	11.6	0.0	19.0	12.1	14.5
LnGrp LOS	C	A	A	A	A	B	B	B	A	B	B	B
Approach Vol, veh/h	388			54			307			298		
Approach Delay, s/veh	22.2			14.1			12.6			13.7		
Approach LOS	C			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.0	12.1	0.0	18.4	6.3	10.8	9.5	8.9				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+12.2), s	4.2	4.2	0.0	3.7	2.9	5.4	6.4	2.9				
Green Ext Time (p_c), s	0.0	1.2	0.0	0.5	0.0	1.0	0.0	0.2				



















### Intersection Summary

HCM 6th Ctrl Delay	16.6
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)








The Ranch  
Near Term Plus Phase 2 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	200	0	240	782	786	0	0	634	440
Future Volume (veh/h)	0	0	0	200	0	240	782	786	0	0	634	440
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	0	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				204	0	75	798	802	0	0	647	135
Peak Hour Factor				0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %				1	0	1	1	1	0	0	1	1
Cap, veh/h				502	0	230	1041	2329	0	0	1612	395
Arrive On Green				0.14	0.00	0.14	0.30	0.65	0.00	0.00	0.25	0.25
Sat Flow, veh/h				3483	0	1598	3483	3676	0	0	6749	1591
Grp Volume(v), veh/h				204	0	75	798	802	0	0	647	135
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1742	1791	0	0	1621	1591
Q Serve(g_s), s				2.1	0.0	1.6	8.1	3.9	0.0	0.0	3.2	2.7
Cycle Q Clear(g_c), s				2.1	0.0	1.6	8.1	3.9	0.0	0.0	3.2	2.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				502	0	230	1041	2329	0	0	1612	395
V/C Ratio(X)				0.41	0.00	0.33	0.77	0.34	0.00	0.00	0.40	0.34
Avail Cap(c_a), veh/h				3849	0	1765	4028	8192	0	0	6666	1635
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				15.1	0.0	15.0	12.4	3.1	0.0	0.0	12.2	12.0
Incr Delay (d2), s/veh				0.2	0.0	0.3	0.5	0.0	0.0	0.0	0.1	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.6	0.0	0.5	2.1	0.1	0.0	0.0	0.8	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				15.3	0.0	15.3	12.9	3.1	0.0	0.0	12.3	12.2
LnGrp LOS				B	A	B	B	A	A	A	B	B
Approach Vol, veh/h					279			1600			782	
Approach Delay, s/veh					15.3			8.0			12.3	
Approach LOS					B			A			B	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	29.3			15.6			13.7			9.6		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	5.9			10.1			5.2			4.1		
Green Ext Time (p_c), s	3.5			1.5			3.0			0.5		
Intersection Summary												
HCM 6th Ctrl Delay	10.0											
HCM 6th LOS	A											

# HCM 6th Signalized Intersection Summary 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	480	0	955	0	0	0	0	1088	270	280	624	0
Future Volume (veh/h)	480	0	955	0	0	0	0	1088	270	280	624	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	500	0	995				0	1133	249	292	650	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1469	0	1307				0	1652	360	393	1644	0
Arrive On Green	0.41	0.00	0.41				0.00	0.31	0.29	0.11	0.46	0.00
Sat Flow, veh/h	3591	0	3195				0	5629	1169	3483	3676	0
Grp Volume(v), veh/h	500	0	995				0	1026	356	292	650	0
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1621	1670	1742	1791	0
Q Serve(g_s), s	6.7	0.0	18.9				0.0	13.1	13.3	5.7	8.5	0.0
Cycle Q Clear(g_c), s	6.7	0.0	18.9				0.0	13.1	13.3	5.7	8.5	0.0
Prop In Lane	1.00		1.00				0.00		0.70	1.00		0.00
Lane Grp Cap(c), veh/h	1469	0	1307				0	1498	514	393	1644	0
V/C Ratio(X)	0.34	0.00	0.76				0.00	0.69	0.69	0.74	0.40	0.00
Avail Cap(c_a), veh/h	4323	0	3847				0	2067	710	641	2384	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.3	0.0	17.9				0.0	21.4	21.9	30.3	12.6	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.9				0.0	0.2	0.6	1.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	6.0				0.0	4.4	4.7	2.3	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.5	0.0	18.8				0.0	21.6	22.6	31.4	12.7	0.0
LnGrp LOS	B	A	B				A	C	C	C	B	A
Approach Vol, veh/h	1495						1382			942		
Approach Delay, s/veh	17.4						21.9			18.5		
Approach LOS	B						C			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	2.0	25.7	32.9	37.7								
Change Period (Y+Rc), s	4.0	5.3	4.5	* 5.3								
Max Green Setting (Gmax), s	3.0	28.7	84.5	* 47								
Max Q Clear Time (g_c+I1), s	3.0	15.3	20.9	10.5								
Green Ext Time (p_c), s	0.3	5.1	7.5	2.7								

## Intersection Summary

HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B

## Notes

User approved volume balancing among the lanes for turning movement.















\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	 		 	
Traffic Volume (veh/h)	30	20	110	840	100	170	170	580	892	50	550	30
Future Volume (veh/h)	30	20	110	840	100	170	170	580	892	50	550	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	21	14	866	103	135	175	598	296	52	567	28
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	50	92	61	1146	212	278	225	1048	811	138	849	42
Arrive On Green	0.03	0.09	0.08	0.23	0.29	0.28	0.13	0.29	0.29	0.08	0.25	0.23
Sat Flow, veh/h	1781	1040	693	5023	734	963	1781	3554	2751	1781	3447	170
Grp Volume(v), veh/h	31	0	35	866	0	238	175	598	296	52	292	303
Grp Sat Flow(s),veh/h/ln	1781	0	1733	1674	0	1697	1781	1777	1376	1781	1777	1840
Q Serve(g_s), s	0.9	0.0	1.0	8.3	0.0	6.0	4.9	7.3	4.4	1.4	7.6	7.7
Cycle Q Clear(g_c), s	0.9	0.0	1.0	8.3	0.0	6.0	4.9	7.3	4.4	1.4	7.6	7.7
Prop In Lane	1.00		0.40	1.00		0.57	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	50	0	153	1146	0	490	225	1048	811	138	437	453
V/C Ratio(X)	0.63	0.00	0.23	0.76	0.00	0.49	0.78	0.57	0.36	0.38	0.67	0.67
Avail Cap(c_a), veh/h	346	0	1111	1952	0	1418	796	4626	3582	138	1657	1716
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	0.0	21.9	18.5	0.0	15.3	21.8	15.4	14.3	22.5	17.5	17.5
Incr Delay (d2), s/veh	4.7	0.0	0.3	0.4	0.0	0.3	2.2	0.2	0.1	0.6	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.4	2.6	0.0	1.9	1.9	2.4	1.1	0.5	2.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.5	0.0	22.2	18.9	0.0	15.6	24.0	15.6	14.4	23.2	18.2	18.2
LnGrp LOS	C	A	C	B	A	B	C	B	B	C	B	B
Approach Vol, veh/h	66		1104			1069			647			
Approach Delay, s/veh	25.6		18.2			16.6			18.6			
Approach LOS	C		B			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	19.2	15.7	8.5	10.5	16.7	5.4	18.9				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	66.1	20.0	32.4	23.0	47.1	10.0	42.4				
Max Q Clear Time (g_c+I), s	13.4	9.3	10.3	3.0	6.9	9.7	2.9	8.0				
Green Ext Time (p_c), s	0.0	3.2	1.5	0.1	0.2	2.0	0.0	0.8				

### Intersection Summary

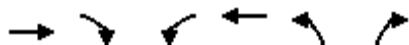
HCM 6th Ctrl Delay	17.9
HCM 6th LOS	B



# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	250	692	50	510	540	120
Future Volume (veh/h)	250	692	50	510	540	120
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	260	248	52	531	562	30
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	994	439	255	903	837	384
Arrive On Green	0.28	0.28	0.07	0.49	0.25	0.25
Sat Flow, veh/h	3589	1546	3401	1841	3401	1560
Grp Volume(v), veh/h	260	248	52	531	562	30
Grp Sat Flow(s), veh/h/ln	1749	1546	1700	1841	1700	1560
Q Serve(g_s), s	1.7	4.2	0.4	6.3	4.5	0.4
Cycle Q Clear(g_c), s	1.7	4.2	0.4	6.3	4.5	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	994	439	255	903	837	384
V/C Ratio(X)	0.26	0.56	0.20	0.59	0.67	0.08
Avail Cap(c_a), veh/h	4028	1781	627	2701	1947	893
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.4	9.3	13.2	5.5	10.3	8.8
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.8	0.1	0.6	1.2	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.5	9.7	13.6	5.8	10.7	8.8
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	508			583	592	
Approach Delay, s/veh	9.1			6.5	10.6	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		11.5	6.3	12.6		18.9
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		17.4	5.1	34.4		44.0
Max Q Clear Time (g_c+I1), s		6.5	2.4	6.2		8.3
Green Ext Time (p_c), s		1.0	0.0	1.4		1.9
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			8.7			
HCM 6th LOS			A			

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HCM 6th Edition methodology cannot be performed with phasing conflicts.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Near Term Plus Phase 2 PM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↕	↗	↖	↕↗		↖↗	↕↗	
Traffic Volume (veh/h)	60	50	60	160	30	130	60	978	140	200	1199	30
Future Volume (veh/h)	60	50	60	160	30	130	60	978	140	200	1199	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	61	51	7	163	31	20	61	998	138	204	1223	30
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	104	87	164	243	255	216	77	1271	176	317	1610	39
Arrive On Green	0.10	0.10	0.10	0.14	0.14	0.14	0.04	0.40	0.39	0.09	0.45	0.44
Sat Flow, veh/h	1000	836	1575	1795	1885	1594	1795	3155	436	3483	3572	88
Grp Volume(v), veh/h	112	0	7	163	31	20	61	566	570	204	613	640
Grp Sat Flow(s),veh/h/ln	1835	0	1575	1795	1885	1594	1795	1791	1800	1742	1791	1869
Q Serve(g_s), s	3.5	0.0	0.2	5.2	0.9	0.7	2.0	16.6	16.6	3.4	17.2	17.2
Cycle Q Clear(g_c), s	3.5	0.0	0.2	5.2	0.9	0.7	2.0	16.6	16.6	3.4	17.2	17.2
Prop In Lane	0.54		1.00	1.00		1.00	1.00		0.24	1.00		0.05
Lane Grp Cap(c), veh/h	192	0	164	243	255	216	77	721	725	317	807	842
V/C Ratio(X)	0.58	0.00	0.04	0.67	0.12	0.09	0.79	0.79	0.79	0.64	0.76	0.76
Avail Cap(c_a), veh/h	1069	0	917	1136	1192	1008	478	2236	2247	928	2236	2333
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.7	0.0	24.2	24.7	22.8	22.7	28.5	15.7	15.7	26.4	13.8	13.8
Incr Delay (d2), s/veh	1.1	0.0	0.0	1.2	0.1	0.1	6.5	0.7	0.7	0.8	0.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.1	2.0	0.3	0.2	0.9	5.4	5.5	1.4	6.0	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.7	0.0	24.2	25.9	22.9	22.8	34.9	16.4	16.5	27.2	14.3	14.3
LnGrp LOS	C	A	C	C	C	C	C	B	B	C	B	B
Approach Vol, veh/h	119		214			1197			1457			
Approach Delay, s/veh	26.6		25.2			17.4			16.1			
Approach LOS	C		C			B			B			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	9.5	28.2	10.3		6.6	31.1	12.1					
Change Period (Y+Rc), s	4.0	4.6	4.0		4.0	4.6	4.6					
Max Green Setting (Gmax), s	6.0	74.4	35.0		16.0	74.4	37.4					
Max Q Clear Time (g_c+15.4)	15.4	18.6	5.5		4.0	19.2	7.2					
Green Ext Time (p_c), s	0.3	4.8	0.3		0.0	6.8	0.3					
Intersection Summary												
HCM 6th Ctrl Delay	17.7											
HCM 6th LOS	B											

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	190	110	70	110	640	120	803	60	900	1053	170
Future Volume (veh/h)	170	190	110	70	110	640	120	803	60	900	1053	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	175	196	55	72	113	660	124	828	59	928	1086	100
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	205	681	186	92	344	1442	336	975	69	955	1302	737
Arrive On Green	0.11	0.24	0.24	0.05	0.18	0.18	0.19	0.29	0.28	0.27	0.36	0.35
Sat Flow, veh/h	1795	2779	760	1795	1885	3195	1795	3390	242	3483	3582	1576
Grp Volume(v), veh/h	175	124	127	72	113	660	124	437	450	928	1086	100
Grp Sat Flow(s),veh/h/ln	1795	1791	1748	1795	1885	1598	1795	1791	1840	1742	1791	1576
Q Serve(g_s), s	10.8	6.4	6.7	4.5	5.9	16.1	6.8	26.0	26.0	29.8	31.3	1.7
Cycle Q Clear(g_c), s	10.8	6.4	6.7	4.5	5.9	16.1	6.8	26.0	26.0	29.8	31.3	1.7
Prop In Lane	1.00		0.43	1.00		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	205	439	428	92	344	1442	336	515	529	955	1302	737
V/C Ratio(X)	0.85	0.28	0.30	0.78	0.33	0.46	0.37	0.85	0.85	0.97	0.83	0.14
Avail Cap(c_a), veh/h	349	1141	1114	175	1017	2584	336	792	814	955	2218	1140
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.1	34.6	34.8	53.0	40.2	21.4	40.1	37.9	38.0	40.6	32.9	6.2
Incr Delay (d2), s/veh	3.9	0.1	0.1	5.2	0.2	0.1	0.3	3.3	3.2	22.2	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	2.7	2.8	2.1	2.7	5.7	2.9	11.4	11.7	15.5	13.4	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.1	34.8	35.0	58.2	40.4	21.5	40.4	41.2	41.2	62.8	33.4	6.2
LnGrp LOS	D	C	C	E	D	C	D	D	D	E	C	A
Approach Vol, veh/h	426				845		1011				2114	
Approach Delay, s/veh	42.4				27.2		41.1				45.0	
Approach LOS	D				C		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	35.0	36.5	9.8	31.7	26.4	45.1	16.9	24.6				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	31.0	48.7	11.0	71.4	11.0	* 69	22.0	60.4				
Max Q Clear Time (g_c+Q1), s	31.8	28.0	6.5	8.7	8.8	33.3	12.8	18.1				
Green Ext Time (p_c), s	0.0	3.1	0.0	0.8	0.0	6.5	0.1	1.9				

### Intersection Summary

HCM 6th Ctrl Delay 40.4  
HCM 6th LOS D

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

The Ranch

8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	80	834	10	40	60	536	948	10	60	1219	180
Future Volume (veh/h)	160	80	834	10	40	60	536	948	10	60	1219	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	126	143	92	11	42	3	564	998	6	63	1283	178
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	224	235	399	15	57	62	690	1983	862	80	1777	247
Arrive On Green	0.12	0.12	0.12	0.04	0.04	0.04	0.20	0.55	0.55	0.04	0.39	0.38
Sat Flow, veh/h	1795	1885	3195	387	1479	1598	3483	3582	1558	1795	4560	633
Grp Volume(v), veh/h	126	143	92	53	0	3	564	998	6	63	965	496
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1866	0	1598	1742	1791	1558	1795	1716	1761
Q Serve(g_s), s	4.4	4.8	1.7	1.9	0.0	0.1	10.4	11.6	0.1	2.3	16.1	16.1
Cycle Q Clear(g_c), s	4.4	4.8	1.7	1.9	0.0	0.1	10.4	11.6	0.1	2.3	16.1	16.1
Prop In Lane	1.00		1.00	0.21		1.00	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	224	235	399	72	0	62	690	1983	862	80	1337	686
V/C Ratio(X)	0.56	0.61	0.23	0.73	0.00	0.05	0.82	0.50	0.01	0.78	0.72	0.72
Avail Cap(c_a), veh/h	588	617	1046	1083	0	927	1296	2878	1252	240	1940	996
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.7	27.9	26.5	32.0	0.0	31.1	25.8	9.3	6.7	31.8	17.4	17.5
Incr Delay (d2), s/veh	0.8	0.9	0.1	5.2	0.0	0.1	0.9	0.1	0.0	6.1	0.3	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.8	2.0	0.6	0.9	0.0	0.0	3.9	3.3	0.0	1.1	5.8	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.5	28.8	26.6	37.2	0.0	31.2	26.7	9.4	6.7	37.9	17.7	18.1
LnGrp LOS	C	C	C	D	A	C	C	A	A	D	B	B
Approach Vol, veh/h	361			56			1568			1524		
Approach Delay, s/veh	28.1			36.8			15.6			18.7		
Approach LOS	C			D			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	41.2		12.4	17.3	30.9		6.6				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	9.0	52.7		21.1	25.0	* 37		39.0				
Max Q Clear Time (g_c+14), s	14.3	13.6		6.8	12.4	18.1		3.9				
Green Ext Time (p_c), s	0.0	4.7		0.7	0.9	7.2		0.1				

## Intersection Summary

HCM 6th Ctrl Delay 18.6

HCM 6th LOS B

## Notes

User approved volume balancing among the lanes for turning movement.













\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	1313	270	110	974	40	210	60	90	50	30	80
Future Volume (veh/h)	110	1313	270	110	974	40	210	60	90	50	30	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	115	1368	214	115	1015	17	219	62	22	52	31	14
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	149	1683	741	166	1718	750	320	316	265	66	138	62
Arrive On Green	0.08	0.47	0.47	0.09	0.48	0.48	0.09	0.17	0.17	0.04	0.11	0.09
Sat Flow, veh/h	1795	3582	1578	1795	3582	1563	3483	1885	1583	1795	1226	554
Grp Volume(v), veh/h	115	1368	214	115	1015	17	219	62	22	52	0	45
Grp Sat Flow(s),veh/h/ln	1795	1791	1578	1795	1791	1563	1742	1885	1583	1795	0	1779
Q Serve(g_s), s	4.3	22.5	5.7	4.3	14.1	0.4	4.2	1.9	0.8	2.0	0.0	1.6
Cycle Q Clear(g_c), s	4.3	22.5	5.7	4.3	14.1	0.4	4.2	1.9	0.8	2.0	0.0	1.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	149	1683	741	166	1718	750	320	316	265	66	0	200
V/C Ratio(X)	0.77	0.81	0.29	0.69	0.59	0.02	0.68	0.20	0.08	0.79	0.00	0.23
Avail Cap(c_a), veh/h	445	2769	1220	445	2769	1209	711	1238	1039	236	0	1038
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.8	15.6	11.1	30.2	13.0	9.4	30.2	24.6	24.1	32.8	0.0	27.9
Incr Delay (d2), s/veh	3.2	0.4	0.1	1.9	0.1	0.0	1.0	0.1	0.0	7.6	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	7.3	1.6	1.8	4.5	0.1	1.6	0.8	0.3	0.9	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	16.0	11.2	32.1	13.1	9.4	31.1	24.7	24.1	40.4	0.0	28.1
LnGrp LOS	C	B	B	C	B	A	C	C	C	D	A	C
Approach Vol, veh/h	1697			1147			303			97		
Approach Delay, s/veh	16.6			14.9			29.3			34.7		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	15.5	10.3	36.2	10.3	11.7	9.7	36.9				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	43.7	43.7	17.0	* 53	14.0	38.7	17.0	* 53				
Max Q Clear Time (g_c+14), s	3.9	3.9	6.3	24.5	6.2	3.6	6.3	16.1				
Green Ext Time (p_c), s	0.0	0.2	0.1	7.6	0.2	0.1	0.1	4.8				

### Intersection Summary

HCM 6th Ctrl Delay	17.7
HCM 6th LOS	B

### Notes










\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	880	412	292	720	230	334	357	252	350	369	30
Future Volume (veh/h)	70	880	412	292	720	230	334	357	252	350	369	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	73	917	179	304	750	103	348	372	158	365	384	27
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	94	1140	495	338	2077	283	416	530	221	436	754	53
Arrive On Green	0.05	0.32	0.32	0.19	0.45	0.45	0.12	0.21	0.20	0.12	0.22	0.21
Sat Flow, veh/h	1810	3610	1568	1810	4616	629	3510	2467	1031	3510	3420	239
Grp Volume(v), veh/h	73	917	179	304	560	293	348	270	260	365	202	209
Grp Sat Flow(s),veh/h/ln	1810	1805	1568	1810	1729	1787	1755	1805	1693	1755	1805	1854
Q Serve(g_s), s	4.0	23.5	8.9	16.5	10.7	10.8	9.8	13.9	14.4	10.2	9.9	10.0
Cycle Q Clear(g_c), s	4.0	23.5	8.9	16.5	10.7	10.8	9.8	13.9	14.4	10.2	9.9	10.0
Prop In Lane	1.00		1.00	1.00		0.35	1.00		0.61	1.00		0.13
Lane Grp Cap(c), veh/h	94	1140	495	338	1556	804	416	387	363	436	398	409
V/C Ratio(X)	0.77	0.80	0.36	0.90	0.36	0.36	0.84	0.70	0.71	0.84	0.51	0.51
Avail Cap(c_a), veh/h	198	1505	654	449	1923	993	488	735	689	558	771	792
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.1	31.6	26.6	40.1	18.2	18.2	43.4	36.5	37.1	43.1	34.5	34.6
Incr Delay (d2), s/veh	5.0	1.8	0.2	14.7	0.1	0.1	9.3	0.9	1.0	7.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	9.9	3.2	8.4	4.0	4.2	4.6	6.0	5.8	4.7	4.2	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.1	33.4	26.8	54.8	18.2	18.3	52.7	37.4	38.1	50.2	34.8	35.0
LnGrp LOS	D	C	C	D	B	B	D	D	D	D	C	C
Approach Vol, veh/h	1169			1157			878			776		
Approach Delay, s/veh	33.6			27.9			43.7			42.1		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	25.6	22.8	35.8	15.9	26.2	9.3	49.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	6.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7				
Max Q Clear Time (g_c+I1), s	12.2	16.4	18.5	25.5	11.8	12.0	6.0	12.8				
Green Ext Time (p_c), s	0.3	1.8	0.2	3.8	0.2	1.3	0.0	3.5				

### Intersection Summary












HCM 6th Ctrl Delay	35.8
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	235	968	160	150	1060	270	150	80	57	570	155	131
Future Volume (veh/h)	235	968	160	150	1060	270	150	80	57	570	155	131
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	245	1008	75	156	1104	82	156	83	3	594	161	33
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	286	1288	573	193	1585	485	117	441	16	692	925	405
Arrive On Green	0.16	0.36	0.36	0.11	0.31	0.31	0.07	0.13	0.11	0.20	0.26	0.26
Sat Flow, veh/h	1795	3582	1594	1795	5147	1574	1795	3525	127	3483	3582	1566
Grp Volume(v), veh/h	245	1008	75	156	1104	82	156	42	44	594	161	33
Grp Sat Flow(s),veh/h/ln	1795	1791	1594	1795	1716	1574	1795	1791	1860	1742	1791	1566
Q Serve(g_s), s	10.2	19.2	2.4	6.5	14.5	2.9	5.0	1.6	1.6	12.6	2.7	1.2
Cycle Q Clear(g_c), s	10.2	19.2	2.4	6.5	14.5	2.9	5.0	1.6	1.6	12.6	2.7	1.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	286	1288	573	193	1585	485	117	224	233	692	925	405
V/C Ratio(X)	0.86	0.78	0.13	0.81	0.70	0.17	1.33	0.19	0.19	0.86	0.17	0.08
Avail Cap(c_a), veh/h	329	2309	1027	258	3115	953	117	1047	1087	865	2749	1202
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	21.8	16.5	33.4	23.3	19.3	35.7	30.0	30.0	29.6	22.0	21.5
Incr Delay (d2), s/veh	16.2	0.4	0.0	9.6	0.2	0.1	195.1	0.1	0.1	6.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	7.1	0.8	3.1	5.3	1.0	8.4	0.7	0.7	5.4	1.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.5	22.2	16.5	42.9	23.5	19.4	230.9	30.1	30.2	35.7	22.1	21.5
LnGrp LOS	D	C	B	D	C	B	F	C	C	D	C	C
Approach Vol, veh/h	1328				1342		242				788	
Approach Delay, s/veh	26.6				25.5		159.5				32.3	
Approach LOS	C				C		F				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.6	12.2	31.5	9.0	23.8	16.2	27.6					
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	43.4	43.4	11.0	48.0	5.0	57.4	14.0	45.0				
Max Q Clear Time (g_c+14.6), s	3.6	3.6	8.5	21.2	7.0	4.7	12.2	16.5				
Green Ext Time (p_c), s	0.6	0.2	0.0	4.7	0.0	0.6	0.1	5.3				

### Intersection Summary

HCM 6th Ctrl Delay	36.1
HCM 6th LOS	D



# HCM 6th Signalized Intersection Summary 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1687	680	220	1827	0	0	0	0	750	0	780
Future Volume (veh/h)	0	1687	680	220	1827	0	0	0	0	750	0	780
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1776	330	232	1923	0				789	0	794
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1704	518	227	2445	0				1706	0	759
Arrive On Green	0.00	0.33	0.33	0.11	0.47	0.00				0.47	0.00	0.47
Sat Flow, veh/h	0	5358	1578	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	1776	330	232	1923	0				789	0	794
Grp Sat Flow(s),veh/h/ln	0	1729	1578	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	46.0	24.9	16.0	43.6	0.0				20.6	0.0	66.0
Cycle Q Clear(g_c), s	0.0	46.0	24.9	16.0	43.6	0.0				20.6	0.0	66.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1704	518	227	2445	0				1706	0	759
V/C Ratio(X)	0.00	1.04	0.64	1.02	0.79	0.00				0.46	0.00	1.05
Avail Cap(c_a), veh/h	0	1704	518	227	2445	0				1706	0	759
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	47.0	39.9	62.0	31.1	0.0				25.0	0.0	37.0
Incr Delay (d2), s/veh	0.0	33.6	2.0	64.9	1.6	0.0				0.1	0.0	45.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	24.4	9.7	6.0	17.7	0.0				8.6	0.0	34.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	80.6	41.9	126.9	32.7	0.0				25.1	0.0	82.3
LnGrp LOS	A	F	D	F	C	A				C	A	F
Approach Vol, veh/h		2106			2155						1583	
Approach Delay, s/veh		74.6			42.8						53.8	
Approach LOS		E			D						D	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	30.0	50.0		70.0		70.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	60.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I1), s	11.0	48.0		68.0		45.6						
Green Ext Time (p_c), s	0.0	0.0		0.0		9.4						

## Intersection Summary

HCM 6th Ctrl Delay 57.2  
HCM 6th LOS E

## Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1907	530	170	1257	580	790	40	400	0	0	0
Future Volume (veh/h)	0	1907	530	170	1257	580	790	40	400	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	0	2007	361	179	1323	374	862	0	274			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	1	1	1	1	1	1	1	1			
Cap, veh/h	0	2406	735	212	3236	977	1023	0	455			
Arrive On Green	0.00	0.47	0.47	0.12	0.63	0.63	0.28	0.00	0.28			
Sat Flow, veh/h	0	5316	1572	1795	5147	1554	3591	0	1598			
Grp Volume(v), veh/h	0	2007	361	179	1323	374	862	0	274			
Grp Sat Flow(s),veh/h/ln	0	1716	1572	1795	1716	1554	1795	0	1598			
Q Serve(g_s), s	0.0	31.5	14.7	9.0	11.9	10.9	20.9	0.0	13.7			
Cycle Q Clear(g_c), s	0.0	31.5	14.7	9.0	11.9	10.9	20.9	0.0	13.7			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2406	735	212	3236	977	1023	0	455			
V/C Ratio(X)	0.00	0.83	0.49	0.84	0.41	0.38	0.84	0.00	0.60			
Avail Cap(c_a), veh/h	0	2668	815	213	3502	1057	1900	0	845			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	21.5	17.0	40.0	8.6	8.4	31.2	0.0	28.6			
Incr Delay (d2), s/veh	0.0	2.0	0.2	24.1	0.0	0.1	0.7	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	11.6	4.8	5.2	3.6	3.0	8.5	0.0	5.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.5	17.2	64.1	8.6	8.5	31.9	0.0	29.1			
LnGrp LOS	A	C	B	E	A	A	C	A	C			
Approach Vol, veh/h		2368			1876			1136				
Approach Delay, s/veh		22.6			13.9			31.2				
Approach LOS		C			B			C				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	4.9	47.3		30.4		62.2						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	46.7			47.7		61.7						
Max Q Clear Time (g_c+I1), s	33.5			22.9		13.9						
Green Ext Time (p_c), s	0.0	8.5		2.2		8.0						

### Intersection Summary

HCM 6th Ctrl Delay	21.4
HCM 6th LOS	C

### Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	50	0	10	50	160	10	60	10	200	100	40
Future Volume (veh/h)	40	50	0	10	50	160	10	60	10	200	100	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	43	54	-2	11	54	76	11	65	3	215	108	34
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	203	194	0	203	73	102	203	545	25	315	591	179
Arrive On Green	0.11	0.10	0.00	0.11	0.10	0.10	0.11	0.16	0.12	0.18	0.22	0.18
Sat Flow, veh/h	1795	1885	0	1795	709	997	1795	3487	160	1795	2705	818
Grp Volume(v), veh/h	43	52	0	11	0	130	11	33	35	215	70	72
Grp Sat Flow(s),veh/h/ln	1795	1885	0	1795	0	1706	1795	1791	1856	1795	1791	1733
Q Serve(g_s), s	0.8	0.9	0.0	0.2	0.0	2.6	0.2	0.6	0.6	4.0	1.1	1.2
Cycle Q Clear(g_c), s	0.8	0.9	0.0	0.2	0.0	2.6	0.2	0.6	0.6	4.0	1.1	1.2
Prop In Lane	1.00		0.00	1.00		0.58	1.00		0.09	1.00		0.47
Lane Grp Cap(c), veh/h	203	194	0	203	0	175	203	280	290	315	391	378
V/C Ratio(X)	0.21	0.27	0.00	0.05	0.00	0.74	0.05	0.12	0.12	0.68	0.18	0.19
Avail Cap(c_a), veh/h	559	1920	0	559	0	1737	1067	2584	2678	1067	2584	2500
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.2	14.6	0.0	14.0	0.0	15.4	14.0	12.8	12.9	13.7	11.2	11.5
Incr Delay (d2), s/veh	0.2	0.3	0.0	0.0	0.0	2.3	0.0	0.1	0.1	1.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.0	0.1	0.0	0.8	0.1	0.2	0.2	1.2	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	14.9	0.0	14.0	0.0	17.7	14.0	12.9	12.9	14.6	11.3	11.6
LnGrp LOS	B	B	A	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	95			141			79			357		
Approach Delay, s/veh	14.7			17.4			13.1			13.4		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	8.0	7.6	8.0	11.7	8.0	7.6					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	11.0	36.0	21.0	49.7	11.0	36.0					
Max Q Clear Time (g_c+I), s	2.6	2.2	2.9	2.2	3.2	2.8	4.6					
Green Ext Time (p_c), s	0.2	0.2	0.0	0.1	0.0	0.5	0.4					

## Intersection Summary

HCM 6th Ctrl Delay 14.4









HCM 6th LOS B

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	110	99	182	90	90	162	695	194	290	683	90
Future Volume (veh/h)	70	110	99	182	90	90	162	695	194	290	683	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	75	118	80	196	97	62	174	747	180	312	734	88
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	97	148	101	235	235	150	215	934	225	353	1299	156
Arrive On Green	0.05	0.14	0.14	0.13	0.22	0.22	0.12	0.32	0.31	0.20	0.40	0.38
Sat Flow, veh/h	1810	1056	716	1810	1083	692	1810	2885	695	1810	3246	389
Grp Volume(v), veh/h	75	0	198	196	0	159	174	467	460	312	408	414
Grp Sat Flow(s),veh/h/ln	1810	0	1771	1810	0	1775	1810	1805	1775	1810	1805	1830
Q Serve(g_s), s	3.1	0.0	8.2	8.0	0.0	5.9	7.1	18.0	18.0	12.7	13.3	13.4
Cycle Q Clear(g_c), s	3.1	0.0	8.2	8.0	0.0	5.9	7.1	18.0	18.0	12.7	13.3	13.4
Prop In Lane	1.00		0.40	1.00		0.39	1.00		0.39	1.00		0.21
Lane Grp Cap(c), veh/h	97	0	249	235	0	385	215	584	575	353	722	732
V/C Ratio(X)	0.77	0.00	0.79	0.83	0.00	0.41	0.81	0.80	0.80	0.88	0.56	0.57
Avail Cap(c_a), veh/h	262	0	862	238	0	841	452	950	934	405	902	915
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	0.0	31.6	32.3	0.0	25.6	32.6	23.5	23.7	29.7	17.7	17.8
Incr Delay (d2), s/veh	4.8	0.0	2.2	20.4	0.0	0.3	2.8	1.0	1.0	16.9	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	3.4	4.6	0.0	2.3	3.1	6.9	6.9	6.7	4.9	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.3	0.0	33.8	52.7	0.0	25.9	35.4	24.4	24.7	46.6	17.9	18.1
LnGrp LOS	D	A	C	D	A	C	D	C	C	D	B	B
Approach Vol, veh/h	273			355			1101			1134		
Approach Delay, s/veh	35.6			40.7			26.3			25.9		
Approach LOS	D			D			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.8	28.6	13.9	14.7	13.0	34.4	8.1	20.5				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	7.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0				
Max Q Clear Time (g_c+I14, s)	14.3	20.0	10.0	10.2	9.1	15.4	5.1	7.9				
Green Ext Time (p_c), s	0.1	3.3	0.0	0.6	0.1	2.9	0.0	0.5				

### Intersection Summary











HCM 6th Ctrl Delay	28.8
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	0	19	70	0	260	7	757	44	70	599	285
Future Volume (veh/h)	114	0	19	70	0	260	7	757	44	70	599	285
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	1870	1870	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	124	0	-7	81	0	144	8	880	13	81	697	285
Peak Hour Factor	0.92	0.92	0.92	0.86	0.92	0.86	0.92	0.86	0.86	0.86	0.86	0.92
Percent Heavy Veh, %	2	2	2	0	2	2	2	0	0	0	0	0
Cap, veh/h	176	0	238	104	0	191	38	1311	572	103	996	407
Arrive On Green	0.10	0.00	0.00	0.06	0.00	0.12	0.02	0.36	0.36	0.06	0.40	0.37
Sat Flow, veh/h	1781	1870	0	1810	0	1585	1781	3610	1574	1810	2499	1022
Grp Volume(v), veh/h	124	-7	-7	81	0	144	8	880	13	81	503	479
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1810	0	1585	1781	1805	1574	1810	1805	1716
Q Serve(g_s), s	3.1	0.0	0.0	2.0	0.0	4.0	0.2	9.4	0.2	2.0	10.6	10.8
Cycle Q Clear(g_c), s	3.1	0.0	0.0	2.0	0.0	4.0	0.2	9.4	0.2	2.0	10.6	10.8
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.60
Lane Grp Cap(c), veh/h	176	0	0	104	0	191	38	1311	572	103	720	684
V/C Ratio(X)	0.70	0.00	0.00	0.78	0.00	0.76	0.21	0.67	0.02	0.78	0.70	0.70
Avail Cap(c_a), veh/h	214	0	0	1344	0	1628	214	3194	1393	435	1814	1725
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	0.0	0.0	21.3	0.0	19.5	22.0	12.3	9.4	21.3	11.5	11.8
Incr Delay (d2), s/veh	7.8	0.0	0.0	4.6	0.0	2.3	2.7	0.2	0.0	4.9	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	0.8	0.0	1.3	0.1	2.7	0.1	0.9	3.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	0.0	0.0	25.8	0.0	21.8	24.7	12.5	9.4	26.2	11.9	12.3
LnGrp LOS	C	A	A	C	A	C	C	B	A	C	B	B
Approach Vol, veh/h	110				225		901				1063	
Approach Delay, s/veh	31.3				23.2		12.6				13.2	
Approach LOS	C				C		B				B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.6	20.6	6.6	11.9	5.0	22.2	8.5	10.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.5	4.5	5.3	4.5	* 4.5				
Max Green Setting (Gmax), s	1.0	39.2	34.0	18.0	5.0	44.7	5.0	* 47				
Max Q Clear Time (g_c+14.0), s	11.4	11.4	4.0	0.0	2.2	12.8	5.1	6.0				
Green Ext Time (p_c), s	0.0	3.9	0.1	0.0	0.0	3.9	0.0	0.5				

### Intersection Summary

HCM 6th Ctrl Delay 14.8

HCM 6th LOS B

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	171	0	32	110	0	120	76	287	90	100	309	119
Future Volume (veh/h)	171	0	32	110	0	120	76	287	90	100	309	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	194	0	-1	125	0	24	86	326	69	114	351	104
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	465	428	363	576	0	363	125	811	170	151	791	231
Arrive On Green	0.23	0.00	0.00	0.23	0.00	0.23	0.07	0.27	0.23	0.08	0.29	0.24
Sat Flow, veh/h	1409	1900	1610	1440	0	1610	1810	2972	621	1810	2755	805
Grp Volume(v), veh/h	194	0	-1	125	0	24	86	196	199	114	228	227
Grp Sat Flow(s), veh/h/ln	1409	1900	1610	1440	0	1610	1810	1805	1788	1810	1805	1755
Q Serve(g_s), s	3.9	0.0	0.0	2.1	0.0	0.3	1.3	2.5	2.6	1.8	3.0	3.1
Cycle Q Clear(g_c), s	6.0	0.0	0.0	2.1	0.0	0.3	1.3	2.5	2.6	1.8	3.0	3.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.35	1.00		0.46
Lane Grp Cap(c), veh/h	465	428	363	576	0	363	125	493	488	151	518	504
V/C Ratio(X)	0.42	0.00	0.00	0.22	0.00	0.07	0.69	0.40	0.41	0.76	0.44	0.45
Avail Cap(c_a), veh/h	2309	2915	2471	2461	0	2471	1767	3084	3056	947	2266	2203
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.0	0.0	0.0	9.4	0.0	8.7	13.0	8.5	8.7	12.9	8.3	8.6
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	0.0	0.0	2.5	0.2	0.2	2.9	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.4	0.0	0.1	0.4	0.5	0.5	0.7	0.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.2	0.0	0.0	9.5	0.0	8.8	15.5	8.7	8.9	15.8	8.6	8.9
LnGrp LOS	B	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h	193			149			481			569		
Approach Delay, s/veh	12.3			9.4			10.0			10.1		
Approach LOS	B			A			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	11.8		10.5	6.0	12.2		10.5				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	47.7	47.7		44.0	28.0	34.7		44.0				
Max Q Clear Time (g_c+I), s	4.6	4.6		8.0	3.3	5.1		4.1				
Green Ext Time (p_c), s	0.1	1.3		0.2	0.1	1.8		0.4				

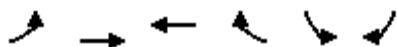
### Intersection Summary

HCM 6th Ctrl Delay	10.3
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 18: Sand Creek Road & Hillcrest Avenue

The Ranch  
Near Term Plus Phase 2 PM Peak Hour

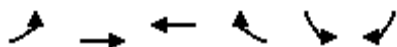


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	100	120	227	247	10
Future Volume (veh/h)	10	100	120	227	247	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	109	130	50	268	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	703	920	658	242	444	395
Arrive On Green	0.26	0.26	0.26	0.23	0.25	0.25
Sat Flow, veh/h	1204	3647	2635	937	1781	1585
Grp Volume(v), veh/h	11	109	89	91	268	7
Grp Sat Flow(s), veh/h/ln	1204	1777	1777	1702	1781	1585
Q Serve(g_s), s	0.1	0.4	0.6	0.7	2.2	0.1
Cycle Q Clear(g_c), s	0.8	0.4	0.6	0.7	2.2	0.1
Prop In Lane	1.00			0.55	1.00	1.00
Lane Grp Cap(c), veh/h	703	920	460	441	444	395
V/C Ratio(X)	0.02	0.12	0.19	0.21	0.60	0.02
Avail Cap(c_a), veh/h	3352	8738	3550	3400	3504	3118
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.0	4.6	4.7	4.8	5.4	4.6
Incr Delay (d2), s/veh	0.0	0.1	0.2	0.2	1.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.0	0.0	0.0	0.0	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	5.1	4.7	4.9	5.1	6.7	4.6
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		120	180		275	
Approach Delay, s/veh		4.7	5.0		6.7	
Approach LOS		A	A		A	
Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			8.2		8.1	8.2
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			39.5		31.5	32.0
Max Q Clear Time (g_c+I1), s			2.8		4.2	2.7
Green Ext Time (p_c), s			0.6		0.8	0.9
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			5.7			
HCM 6th LOS			A			
<b>Notes</b>						
User approved pedestrian interval to be less than phase max green.						

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

The Ranch  
Near Term Plus Phase 2 PM Peak Hour

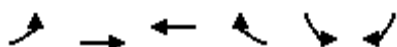


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	327	337	120	140	10
Future Volume (veh/h)	10	327	337	120	140	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	355	366	87	152	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	38	973	554	130	1085	966
Arrive On Green	0.02	0.27	0.19	0.19	0.61	0.61
Sat Flow, veh/h	1781	3647	2949	671	1781	1585
Grp Volume(v), veh/h	11	355	226	227	152	7
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1750	1781	1585
Q Serve(g_s), s	0.4	5.5	8.0	8.2	2.5	0.1
Cycle Q Clear(g_c), s	0.4	5.5	8.0	8.2	2.5	0.1
Prop In Lane	1.00			0.38	1.00	1.00
Lane Grp Cap(c), veh/h	38	973	345	340	1085	966
V/C Ratio(X)	0.29	0.36	0.66	0.67	0.14	0.01
Avail Cap(c_a), veh/h	817	4144	1153	1135	1085	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	20.1	25.5	25.6	5.7	5.2
Incr Delay (d2), s/veh	4.2	0.2	2.1	2.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.0	3.2	3.3	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.2	20.3	27.6	27.9	6.0	5.3
LnGrp LOS	D	C	C	C	A	A
Approach Vol, veh/h		366	453		159	
Approach Delay, s/veh		20.8	27.7		5.9	
Approach LOS		C	C		A	
Timer - Assigned Phs			4		6	7 8
Phs Duration (G+Y+Rc), s			22.7		45.7	5.4 17.3
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			79.3		41.2	30.9 43.9
Max Q Clear Time (g_c+I1), s			7.5		4.5	2.4 10.2
Green Ext Time (p_c), s			2.3		0.4	0.0 2.6
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			21.6			
HCM 6th LOS			C			



# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	194	333	449	190	1420	148
Future Volume (veh/h)	194	333	449	190	1420	148
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	211	362	488	60	1543	159
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	200	551	551	467	1865	855
Arrive On Green	0.29	0.29	0.29	0.29	0.53	0.53
Sat Flow, veh/h	873	1900	1900	1610	3510	1610
Grp Volume(v), veh/h	211	362	488	60	1543	159
Grp Sat Flow(s),veh/h/ln	873	1900	1900	1610	1755	1610
Q Serve(g_s), s	2.0	7.5	11.0	1.2	16.5	2.3
Cycle Q Clear(g_c), s	13.0	7.5	11.0	1.2	16.5	2.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	200	551	551	467	1865	855
V/C Ratio(X)	1.06	0.66	0.88	0.13	0.83	0.19
Avail Cap(c_a), veh/h	200	551	551	467	6192	2840
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.2	13.9	15.2	11.7	8.8	5.5
Incr Delay (d2), s/veh	78.9	2.3	15.3	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	2.7	5.8	0.3	3.2	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	101.1	16.2	30.5	11.8	9.2	5.5
LnGrp LOS	F	B	C	B	A	A
Approach Vol, veh/h		573	548		1702	
Approach Delay, s/veh		47.5	28.4		8.8	
Approach LOS		D	C		A	
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		17.0			17.0	27.8
Change Period (Y+Rc), s		5.3			5.3	5.3
Max Green Setting (Gmax), s		11.7			11.7	77.7
Max Q Clear Time (g_c+I1), s		15.0			13.0	18.5
Green Ext Time (p_c), s		0.0			0.0	4.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			20.5			
HCM 6th LOS			C			

## Notes








User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	1606	0	0	342	990	297	10	260	0	0	0
Future Volume (veh/h)	157	1606	0	0	342	990	297	10	260	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	165	1691	0	0	360	607	321	0	233			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	298	2908	0	0	711	1206	855	0	381			
Arrive On Green	0.08	0.56	0.00	0.00	0.37	0.37	0.24	0.00	0.24			
Sat Flow, veh/h	3510	5358	0	0	1900	3220	3619	0	1610			
Grp Volume(v), veh/h	165	1691	0	0	360	607	321	0	233			
Grp Sat Flow(s),veh/h/ln	1755	1729	0	0	1900	1610	1810	0	1610			
Q Serve(g_s), s	1.8	8.4	0.0	0.0	5.8	5.7	2.9	0.0	5.1			
Cycle Q Clear(g_c), s	1.8	8.4	0.0	0.0	5.8	5.7	2.9	0.0	5.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	298	2908	0	0	711	1206	855	0	381			
V/C Ratio(X)	0.55	0.58	0.00	0.00	0.51	0.50	0.38	0.00	0.61			
Avail Cap(c_a), veh/h	1425	9872	0	0	2652	4495	4316	0	1920			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	17.3	5.6	0.0	0.0	9.5	9.5	12.6	0.0	13.4			
Incr Delay (d2), s/veh	0.6	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.6	1.1	0.0	0.0	1.5	1.2	0.9	0.0	0.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.9	5.7	0.0	0.0	9.7	9.6	12.7	0.0	14.0			
LnGrp LOS	B	A	A	A	A	A	B	A	B			
Approach Vol, veh/h	1856			967			554					
Approach Delay, s/veh	6.8			9.7			13.3					
Approach LOS	A			A			B					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	26.1			13.3		7.3	18.8					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	73.7			45.7		16.0	53.7					
Max Q Clear Time (g_c+I1), s	10.4			7.1		3.8	7.8					
Green Ext Time (p_c), s	10.4			0.9		0.2	2.6					

### Intersection Summary




HCM 6th Ctrl Delay	8.7
HCM 6th LOS	A

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Near Term Plus Phase 2 PM Peak Hour

Intersection						
Int Delay, s/veh	16.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	463	110	50	384	87
Future Vol, veh/h	40	463	110	50	384	87
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	44	509	121	55	422	96
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1089	149	0	0	176	0
Stage 1	149	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	241	903	-	-	1412	-
Stage 1	884	-	-	-	-	-
Stage 2	383	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	165	903	-	-	1412	-
Mov Cap-2 Maneuver	165	-	-	-	-	-
Stage 1	884	-	-	-	-	-
Stage 2	262	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	31.2	0	7			
HCM LOS	D					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	666	1412	-	
HCM Lane V/C Ratio	-	-	0.83	0.299	-	
HCM Control Delay (s)	-	-	31.2	8.6	0	
HCM Lane LOS	-	-	D	A	A	
HCM 95th %tile Q(veh)	-	-	9	1.3	-	

# HCM 6th Signalized Intersection Summary 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↰↰	↱	↰	↰↰	
Traffic Volume (veh/h)	105	1307	866	30	630	610	
Future Volume (veh/h)	105	1307	866	30	630	610	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	112	1390	921	0	670	625	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	182	1534	1223		889	1539	
Arrive On Green	0.05	0.43	0.34	0.00	0.50	0.50	
Sat Flow, veh/h	3456	3647	3647	1585	1781	2790	
Grp Volume(v), veh/h	112	1390	921	0	670	625	
Grp Sat Flow(s),veh/h/ln	1728	1777	1777	1585	1781	1395	
Q Serve(g_s), s	3.6	42.0	26.4	0.0	34.7	14.9	
Cycle Q Clear(g_c), s	3.6	42.0	26.4	0.0	34.7	14.9	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	182	1534	1223		889	1539	
V/C Ratio(X)	0.61	0.91	0.75		0.75	0.41	
Avail Cap(c_a), veh/h	361	1740	1245		889	1539	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	53.3	30.5	33.4	0.0	23.1	14.9	
Incr Delay (d2), s/veh	1.3	6.2	2.3	0.0	3.3	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.6	18.0	11.2	0.0	14.9	14.5	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	54.6	36.8	35.7	0.0	26.4	15.0	
LnGrp LOS	D	D	D		C	B	
Approach Vol, veh/h							
		1502	921	A	1295		
Approach Delay, s/veh							
		38.1	35.7		20.9		
Approach LOS							
		D	D		C		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				53.6	61.4	10.1	43.6
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				55.8	50.2	11.5	39.8
Max Q Clear Time (g_c+I1), s				44.0	36.7	5.6	28.4
Green Ext Time (p_c), s				5.1	2.5	0.1	3.1
Intersection Summary							
HCM 6th Ctrl Delay			31.5				
HCM 6th LOS			C				

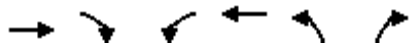
## Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary

## 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Near Term Plus Phase 2 PM Peak Hour














Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	1380	580	0	1240	196	70
Future Volume (veh/h)	1380	580	0	1240	196	70
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1500	402	0	1348	213	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	1902	848	0	1902	1366	626
Arrive On Green	0.54	0.54	0.00	0.54	0.40	0.40
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1500	402	0	1348	213	23
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	39.0	18.2	0.0	32.7	4.6	1.0
Cycle Q Clear(g_c), s	39.0	18.2	0.0	32.7	4.6	1.0
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1902	848	0	1902	1366	626
V/C Ratio(X)	0.79	0.47	0.00	0.71	0.16	0.04
Avail Cap(c_a), veh/h	2565	1144	0	2565	1366	626
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	16.6	0.0	20.0	22.4	21.3
Incr Delay (d2), s/veh	1.2	0.4	0.0	0.6	0.2	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	5.8	6.5	0.0	12.4	1.9	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	22.7	17.1	0.0	20.6	22.7	21.5
LnGrp LOS	C	B	A	C	C	C
Approach Vol, veh/h	1902			1348	236	
Approach Delay, s/veh	21.5			20.6	22.5	
Approach LOS	C			C	C	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	49.5			65.5		65.5
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	23.5			82.5		82.5
Max Q Clear Time (g_c+I1), s	6.6			41.0		34.7
Green Ext Time (p_c), s	0.7			20.0		12.8
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			21.2			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Near Term Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	187	30	227	0	20	0	81	160	0	10	260	165
Future Volume (veh/h)	187	30	227	0	20	0	81	160	0	10	260	165
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	199	32	241	0	21	0	86	170	0	11	277	176
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	256	721	611	5	258	0	163	974	434	49	747	333
Arrive On Green	0.14	0.39	0.39	0.00	0.14	0.00	0.09	0.27	0.00	0.03	0.21	0.21
Sat Flow, veh/h	1781	1870	1585	1781	1870	0	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	199	32	241	0	21	0	86	170	0	11	277	176
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	0	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.1	0.4	4.2	0.0	0.4	0.0	1.8	1.4	0.0	0.2	2.6	3.8
Cycle Q Clear(g_c), s	4.1	0.4	4.2	0.0	0.4	0.0	1.8	1.4	0.0	0.2	2.6	3.8
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	256	721	611	5	258	0	163	974	434	49	747	333
V/C Ratio(X)	0.78	0.04	0.39	0.00	0.08	0.00	0.53	0.17	0.00	0.22	0.37	0.53
Avail Cap(c_a), veh/h	256	902	765	256	902	0	256	1807	806	256	1807	806
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.8	7.4	8.5	0.0	14.4	0.0	16.6	10.6	0.0	18.2	13.0	13.5
Incr Delay (d2), s/veh	14.2	0.0	0.4	0.0	0.1	0.0	2.7	0.1	0.0	2.3	0.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.1	1.1	0.0	0.1	0.0	0.7	0.4	0.0	0.1	0.8	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.0	7.4	8.9	0.0	14.5	0.0	19.3	10.7	0.0	20.5	13.3	14.8
LnGrp LOS	C	A	A	A	B	A	B	B	A	C	B	B
Approach Vol, veh/h	472		21			256		464				
Approach Delay, s/veh	17.7		14.5			13.6		14.0				
Approach LOS	B		B			B		B				
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.1	14.5	0.0	18.8	7.5	12.1	9.5	9.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+I12, s)	3.4	3.4	0.0	6.2	3.8	5.8	6.1	2.4				
Green Ext Time (p_c), s	0.0	0.7	0.0	0.7	0.0	1.8	0.0	0.0				

### Intersection Summary



















HCM 6th Ctrl Delay	15.4
HCM 6th LOS	B



# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	370	10	450	1093	943	0	0	796	530
Future Volume (veh/h)	0	0	0	370	10	450	1093	943	0	0	796	530
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	1885	1885	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				402	11	390	1188	1025	0	0	865	230
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				1	1	1	2	2	0	0	2	2
Cap, veh/h				981	0	450	1291	2248	0	0	1392	341
Arrive On Green				0.28	0.28	0.28	0.37	0.63	0.00	0.00	0.22	0.22
Sat Flow, veh/h				3483	0	1598	3456	3647	0	0	6696	1576
Grp Volume(v), veh/h				402	0	390	1188	1025	0	0	865	230
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1728	1777	0	0	1609	1576
Q Serve(g_s), s				8.8	0.0	21.7	30.7	13.9	0.0	0.0	11.4	12.5
Cycle Q Clear(g_c), s				8.8	0.0	21.7	30.7	13.9	0.0	0.0	11.4	12.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				981	0	450	1291	2248	0	0	1392	341
V/C Ratio(X)				0.41	0.00	0.87	0.92	0.46	0.00	0.00	0.62	0.67
Avail Cap(c_a), veh/h				1602	0	735	1663	3383	0	0	2753	674
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				27.3	0.0	31.9	28.0	8.9	0.0	0.0	33.2	33.6
Incr Delay (d2), s/veh				0.1	0.0	3.4	6.5	0.1	0.0	0.0	0.2	0.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.4	0.0	8.2	12.7	4.3	0.0	0.0	4.2	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				27.4	0.0	35.3	34.4	8.9	0.0	0.0	33.3	34.5
LnGrp LOS				C	A	D	C	A	A	A	C	C
Approach Vol, veh/h					792			2213			1095	
Approach Delay, s/veh					31.3			22.6			33.6	
Approach LOS					C			C			C	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	63.1			38.9			24.2			30.3		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	15.9			32.7			14.5			23.7		
Green Ext Time (p_c), s	4.9			2.2			4.1			1.4		
Intersection Summary												
HCM 6th Ctrl Delay	27.2											
HCM 6th LOS	C											










# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	460	10	785	0	0	0	0	1576	240	310	856	0
Future Volume (veh/h)	460	10	785	0	0	0	0	1576	240	310	856	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1885	1885	1870	1870	0
Adj Flow Rate, veh/h	500	0	860				0	1713	239	337	930	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	1	1	2	2	0
Cap, veh/h	1232	0	1096				0	2262	316	422	1933	0
Arrive On Green	0.35	0.00	0.35				0.00	0.39	0.38	0.12	0.54	0.00
Sat Flow, veh/h	3534	0	3145				0	6058	808	3456	3647	0
Grp Volume(v), veh/h	500	0	860				0	1438	514	337	930	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1621	1738	1728	1777	0
Q Serve(g_s), s	9.3	0.0	21.2				0.0	22.1	22.2	8.2	14.0	0.0
Cycle Q Clear(g_c), s	9.3	0.0	21.2				0.0	22.1	22.2	8.2	14.0	0.0
Prop In Lane	1.00		1.00				0.00		0.47	1.00		0.00
Lane Grp Cap(c), veh/h	1232	0	1096				0	1899	679	422	1933	0
V/C Ratio(X)	0.41	0.00	0.78				0.00	0.76	0.76	0.80	0.48	0.00
Avail Cap(c_a), veh/h	2822	0	2511				0	2364	845	680	2590	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.4	0.0	25.2				0.0	22.8	23.1	36.9	12.2	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.3				0.0	0.8	2.3	1.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	7.3				0.0	7.7	8.6	3.3	4.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.6	0.0	26.5				0.0	23.6	25.4	38.2	12.2	0.0
LnGrp LOS	C	A	C				A	C	C	D	B	A
Approach Vol, veh/h	1360						1952			1267		
Approach Delay, s/veh	24.7						24.1			19.2		
Approach LOS	C						C			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	4.6	37.7	34.1		52.3							
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	7.0	40.7	68.5		* 63							
Max Q Clear Time (g_c+I10), s	10.2	24.2	23.2		16.0							
Green Ext Time (p_c), s	0.4	8.2	6.4		4.3							

### Intersection Summary

HCM 6th Ctrl Delay	22.9
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.












\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	20	90	532	100	190	340	670	1371	60	790	60
Future Volume (veh/h)	30	20	90	532	100	190	340	670	1371	60	790	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1841	1841	1841	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	33	22	8	578	109	0	370	728	633	65	859	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	4	4	4	2	2	2	5	5	5
Cap, veh/h	46	98	36	718	364	0	410	1768	1367	97	1062	74
Arrive On Green	0.03	0.08	0.07	0.15	0.20	0.00	0.23	0.50	0.50	0.06	0.32	0.31
Sat Flow, veh/h	1697	1239	450	4944	1841	0	1781	3554	2747	1739	3289	230
Grp Volume(v), veh/h	33	0	30	578	109	0	370	728	633	65	453	466
Grp Sat Flow(s),veh/h/ln	1697	0	1689	1648	1841	0	1781	1777	1374	1739	1735	1784
Q Serve(g_s), s	1.4	0.0	1.2	8.1	3.6	0.0	14.5	9.3	10.8	2.6	17.2	17.2
Cycle Q Clear(g_c), s	1.4	0.0	1.2	8.1	3.6	0.0	14.5	9.3	10.8	2.6	17.2	17.2
Prop In Lane	1.00		0.27	1.00		0.00	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	46	0	134	718	364	0	410	1768	1367	97	560	576
V/C Ratio(X)	0.72	0.00	0.22	0.80	0.30	0.00	0.90	0.41	0.46	0.67	0.81	0.81
Avail Cap(c_a), veh/h	118	0	697	824	938	0	421	2384	1843	97	851	875
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.8	0.0	31.1	29.8	24.6	0.0	26.9	11.4	11.8	33.4	22.3	22.4
Incr Delay (d2), s/veh	7.8	0.0	0.3	4.4	0.2	0.0	21.4	0.1	0.1	13.9	1.9	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.5	3.2	1.5	0.0	8.0	3.0	2.7	1.4	6.4	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.6	0.0	31.4	34.2	24.8	0.0	48.3	11.5	11.9	47.3	24.2	24.2
LnGrp LOS	D	A	C	C	C	A	D	B	B	D	C	C
Approach Vol, veh/h	63			687			1731			984		
Approach Delay, s/veh	37.3			32.7			19.5			25.7		
Approach LOS	D			C			B			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	39.8	14.5	9.7	20.6	27.3	5.9	18.2				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	47.4	12.0	29.1	17.0	34.4	5.0	36.1				
Max Q Clear Time (g_c+14.6)	14.6	12.8	10.1	3.2	16.5	19.2	3.4	5.6				
Green Ext Time (p_c), s	0.0	4.9	0.3	0.1	0.0	3.0	0.0	0.3				

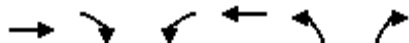
### Intersection Summary

HCM 6th Ctrl Delay	24.2
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	490	961	260	360	462	350
Future Volume (veh/h)	490	961	260	360	462	350
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1366	1366	1856	1856
Adj Flow Rate, veh/h	533	673	283	391	502	380
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	36	36	3	3
Cap, veh/h	1656	733	363	902	820	376
Arrive On Green	0.47	0.47	0.14	0.66	0.24	0.24
Sat Flow, veh/h	3647	1573	2525	1366	3428	1572
Grp Volume(v), veh/h	533	673	283	391	502	380
Grp Sat Flow(s),veh/h/ln	1777	1573	1262	1366	1714	1572
Q Serve(g_s), s	7.5	31.7	8.6	10.8	10.4	19.0
Cycle Q Clear(g_c), s	7.5	31.7	8.6	10.8	10.4	19.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1656	733	363	902	820	376
V/C Ratio(X)	0.32	0.92	0.78	0.43	0.61	1.01
Avail Cap(c_a), veh/h	1968	871	477	1083	820	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.3	19.8	32.8	6.4	27.0	30.2
Incr Delay (d2), s/veh	0.0	12.0	6.0	0.1	1.0	49.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	12.1	2.7	2.2	4.2	11.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.4	31.8	38.8	6.5	27.9	79.4
LnGrp LOS	B	C	D	A	C	F
Approach Vol, veh/h	1206			674	882	
Approach Delay, s/veh	23.7			20.1	50.1	
Approach LOS	C			C	D	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		23.0	15.4	41.0		56.5
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		19.0	14.5	43.4		62.4
Max Q Clear Time (g_c+I1), s		21.0	10.6	33.7		12.8
Green Ext Time (p_c), s		0.0	0.4	2.7		1.4
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			31.2			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱		↰↱↰↱					↰↱↰↱		↰↱↰↱	↰↱↰↱	
Traffic Volume (veh/h)	270	20	1099	0	0	0	0	2111	416	200	782	0
Future Volume (veh/h)	270	20	1099	0	0	0	0	2111	416	200	782	0
Initial Q (Qb), veh	0	0	60				0	60	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1826	1826	0
Adj Flow Rate, veh/h	293	22	667				0	2295	430	217	850	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	590	0	603				0	2881	402	280	3755	0
Arrive On Green	0.18	0.18	0.18				0.00	0.61	0.60	0.08	0.74	0.00
Sat Flow, veh/h	3456	0	3614				0	5032	794	3374	5149	0
Grp Volume(v), veh/h	293	0	667				0	1798	927	217	850	0
Grp Sat Flow(s), veh/h/ln	1728	0	1205				0	1122	1711	1687	1662	0
Q Serve(g_s), s	7.8	0.0	18.0				0.0	45.2	46.7	6.4	5.3	0.0
Cycle Q Clear(g_c), s	7.8	0.0	18.0				0.0	45.2	46.7	6.4	5.3	0.0
Prop In Lane	1.00		1.00				0.00		0.46	1.00		0.00
Lane Grp Cap(c), veh/h	590	0	603				0	2097	1075	280	3755	0
V/C Ratio(X)	0.50	0.00	1.11				0.00	0.86	0.86	0.77	0.23	0.00
Avail Cap(c_a), veh/h	610	0	638				0	2247	1142	397	3713	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.6	0.0	44.9				0.0	18.3	17.7	47.4	3.9	0.0
Incr Delay (d2), s/veh	0.2	0.0	68.9				0.0	3.1	6.2	3.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	358.0				0.0	23.3	10.1	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	29.0				0.0	17.4	22.3	2.8	1.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.9	0.0	471.8				0.0	44.7	34.0	50.9	3.9	0.0
LnGrp LOS	D	A	F				A	D	C	D	A	A
Approach Vol, veh/h	960						2725			1067		
Approach Delay, s/veh	340.0						41.1			13.4		
Approach LOS	F						D			B		
Timer - Assigned Phs	1	2		4			6					
Phs Duration (G+Y+Rc), s	3.4	66.5		22.0			79.9					
Change Period (Y+Rc), s	4.9	* 4.9		5.3			4.9					
Max Green Setting (Gmax), s	2.0	* 67		16.7			46.1					
Max Q Clear Time (g_c+I), s	13.4	48.7		20.0			7.3					
Green Ext Time (p_c), s	0.1	12.9		0.0			3.9					

### Intersection Summary

HCM 6th Ctrl Delay	95.3
HCM 6th LOS	F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	↰
Traffic Volume (veh/h)	40	30	30	220	40	260	40	1786	170	180	891	30
Future Volume (veh/h)	40	30	30	220	40	260	40	1786	170	180	891	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	33	0	239	43	28	43	1941	182	196	968	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	1	1	1	2	2	2	2	2	2
Cap, veh/h	74	57	115	279	293	248	55	1895	175	251	2167	72
Arrive On Green	0.07	0.07	0.00	0.16	0.16	0.16	0.03	0.58	0.57	0.07	0.62	0.61
Sat Flow, veh/h	1021	784	1572	1795	1885	1595	1781	3288	303	3456	3508	116
Grp Volume(v), veh/h	76	0	0	239	43	28	43	1034	1089	196	490	510
Grp Sat Flow(s), veh/h/ln	1804	0	1572	1795	1885	1595	1781	1777	1815	1728	1777	1847
Q Serve(g_s), s	5.3	0.0	0.0	16.9	2.6	2.0	3.1	75.0	75.0	7.3	19.0	19.0
Cycle Q Clear(g_c), s	5.3	0.0	0.0	16.9	2.6	2.0	3.1	75.0	75.0	7.3	19.0	19.0
Prop In Lane	0.57		1.00	1.00		1.00	1.00		0.17	1.00		0.06
Lane Grp Cap(c), veh/h	131	0	115	279	293	248	55	1024	1046	251	1098	1141
V/C Ratio(X)	0.58	0.00	0.00	0.86	0.15	0.11	0.78	1.01	1.04	0.78	0.45	0.45
Avail Cap(c_a), veh/h	485	0	423	524	550	466	219	1024	1046	425	1098	1141
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	0.0	0.0	53.5	47.5	47.3	62.6	27.6	27.6	59.3	13.1	13.1
Incr Delay (d2), s/veh	1.5	0.0	0.0	3.0	0.1	0.1	8.3	30.6	39.1	2.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	7.7	1.2	0.8	1.5	37.1	40.4	3.3	7.4	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.9	0.0	0.0	56.5	47.6	47.3	70.9	58.2	66.7	61.4	13.2	13.3
LnGrp LOS	E	A	A	E	D	D	E	F	F	E	B	B
Approach Vol, veh/h	76			310			2166			1196		
Approach Delay, s/veh	59.9			54.4			62.7			21.1		
Approach LOS	E			D			E			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.4	79.0		13.5	8.1	84.4		24.2				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+19.3)	19.3	77.0		7.3	5.1	21.0		18.9				
Green Ext Time (p_c), s	0.2	0.0		0.2	0.0	4.8		0.4				

### Intersection Summary

HCM 6th Ctrl Delay	48.7
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	150	90	90	200	900	100	1026	30	540	971	150
Future Volume (veh/h)	160	150	90	90	200	900	100	1026	30	540	971	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	174	163	35	98	217	978	109	1115	32	587	1055	84
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	2	2	2
Cap, veh/h	197	937	196	119	523	1463	282	1140	33	638	1207	698
Arrive On Green	0.11	0.32	0.32	0.07	0.28	0.27	0.16	0.32	0.31	0.18	0.34	0.33
Sat Flow, veh/h	1781	2915	610	1795	1885	3195	1795	3554	102	3456	3554	1582
Grp Volume(v), veh/h	174	98	100	98	217	978	109	562	585	587	1055	84
Grp Sat Flow(s), veh/h/ln	1781	1777	1748	1795	1885	1598	1795	1791	1865	1728	1777	1582
Q Serve(g_s), s	14.4	5.9	6.2	8.1	14.1	35.8	8.2	46.5	46.5	25.0	41.7	2.6
Cycle Q Clear(g_c), s	14.4	5.9	6.2	8.1	14.1	35.8	8.2	46.5	46.5	25.0	41.7	2.6
Prop In Lane	1.00		0.35	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	197	571	562	119	523	1463	282	574	598	638	1207	698
V/C Ratio(X)	0.89	0.17	0.18	0.83	0.42	0.67	0.39	0.98	0.98	0.92	0.87	0.12
Avail Cap(c_a), veh/h	274	879	864	120	768	1880	282	574	598	739	1639	891
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.6	36.5	36.6	69.0	44.2	31.7	56.6	50.3	50.3	59.9	46.4	10.2
Incr Delay (d2), s/veh	17.4	0.1	0.1	33.3	0.2	0.3	0.3	31.7	31.1	14.4	3.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	7.4	2.6	2.6	4.8	6.5	13.4	3.7	25.3	26.2	12.2	19.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	83.0	36.5	36.7	102.4	44.4	32.0	56.9	82.0	81.4	74.3	49.8	10.3
LnGrp LOS	F	D	D	F	D	C	E	F	F	E	D	B
Approach Vol, veh/h					1293		1256		1726			
Approach Delay, s/veh					39.4		79.6		56.2			
Approach LOS	E				D		E		E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	31.6	52.0	13.9	52.1	28.8	54.8	20.5	45.5				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	32.0	46.7	10.0	73.4	11.0	* 68	23.0	60.4				
Max Q Clear Time (g_c+0.7), s	27.0	48.5	10.1	8.2	10.2	43.7	16.4	37.8				
Green Ext Time (p_c), s	0.7	0.0	0.0	0.6	0.0	5.8	0.1	3.1				

### Intersection Summary

HCM 6th Ctrl Delay 58.0

HCM 6th LOS E

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

The Ranch

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	720	310	906	10	150	90	843	1396	20	80	911	170
Future Volume (veh/h)	720	310	906	10	150	90	843	1396	20	80	911	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	560	649	118	11	163	8	916	1517	9	87	990	164
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	2	2	2
Cap, veh/h	301	316	535	14	211	188	984	1794	782	111	1205	199
Arrive On Green	0.17	0.17	0.17	0.12	0.12	0.12	0.28	0.50	0.50	0.06	0.27	0.27
Sat Flow, veh/h	1795	1885	3195	118	1747	1555	3483	3582	1561	1781	4399	727
Grp Volume(v), veh/h	560	649	118	174	0	8	916	1517	9	87	765	389
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1864	0	1555	1742	1791	1561	1781	1702	1722
Q Serve(g_s), s	18.0	18.0	3.4	9.7	0.0	0.5	27.5	39.4	0.3	5.2	22.7	22.8
Cycle Q Clear(g_c), s	18.0	18.0	3.4	9.7	0.0	0.5	27.5	39.4	0.3	5.2	22.7	22.8
Prop In Lane	1.00		1.00	0.06		1.00	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	301	316	535	225	0	188	984	1794	782	111	932	472
V/C Ratio(X)	1.86	2.06	0.22	0.77	0.00	0.04	0.93	0.85	0.01	0.79	0.82	0.82
Avail Cap(c_a), veh/h	301	316	535	676	0	564	1069	1865	813	182	1076	544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.8	44.8	38.7	45.8	0.0	41.8	37.6	23.2	13.5	49.7	36.6	36.7
Incr Delay (d2), s/veh	401.0	486.3	0.1	2.1	0.0	0.0	12.8	3.4	0.0	4.6	4.0	7.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.2	50.7	1.3	4.5	0.0	0.2	12.8	15.8	0.1	2.4	9.8	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	445.7	531.0	38.8	47.9	0.0	41.8	50.4	26.7	13.5	54.3	40.5	44.4
LnGrp LOS	F	F	D	D	A	D	D	C	B	D	D	D
Approach Vol, veh/h	1327			182			2442			1241		
Approach Delay, s/veh	451.3			47.7			35.5			42.7		
Approach LOS	F			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	57.9			22.0	34.4	34.1		17.0				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	54.7			17.1	33.0	* 33		39.0				
Max Q Clear Time (g_c+11), s	41.4			20.0	29.5	24.8		11.7				
Green Ext Time (p_c), s	0.0	6.1		0.0	0.8	3.7		0.5				

### Intersection Summary

HCM 6th Ctrl Delay 143.9

HCM 6th LOS F

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.















# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1042	205	200	1379	80	330	150	180	70	180	120
Future Volume (veh/h)	50	1042	205	200	1379	80	330	150	180	70	180	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	54	1133	115	217	1499	16	359	163	22	76	196	112
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	70	1267	556	246	1619	706	422	598	494	97	279	160
Arrive On Green	0.04	0.35	0.35	0.14	0.45	0.45	0.12	0.32	0.32	0.05	0.25	0.24
Sat Flow, veh/h	1795	3582	1572	1795	3582	1561	3483	1885	1557	1810	1116	638
Grp Volume(v), veh/h	54	1133	115	217	1499	16	359	163	22	76	0	308
Grp Sat Flow(s),veh/h/ln	1795	1791	1572	1795	1791	1561	1742	1885	1557	1810	0	1754
Q Serve(g_s), s	3.5	34.7	5.9	13.8	45.8	0.7	11.7	7.5	1.1	4.8	0.0	18.6
Cycle Q Clear(g_c), s	3.5	34.7	5.9	13.8	45.8	0.7	11.7	7.5	1.1	4.8	0.0	18.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	70	1267	556	246	1619	706	422	598	494	97	0	439
V/C Ratio(X)	0.77	0.89	0.21	0.88	0.93	0.02	0.85	0.27	0.04	0.78	0.00	0.70
Avail Cap(c_a), veh/h	139	1277	561	371	1739	758	570	773	638	171	0	598
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	55.3	35.5	26.2	49.2	30.0	17.6	50.0	29.6	27.4	54.3	0.0	39.8
Incr Delay (d2), s/veh	6.6	8.1	0.1	10.6	8.3	0.0	7.0	0.1	0.0	5.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	15.8	2.2	6.7	20.1	0.2	5.4	3.3	0.4	2.3	0.0	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.0	43.6	26.2	59.8	38.3	17.6	57.0	29.7	27.5	59.3	0.0	40.9
LnGrp LOS	E	D	C	E	D	B	E	C	C	E	A	D
Approach Vol, veh/h	1302			1732			544			384		
Approach Delay, s/veh	42.8			40.8			47.6			44.5		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	40.9	19.9	45.1	18.1	33.0	8.5	56.5					
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	46.3	24.0	* 41	19.0	38.3	9.0	* 56					
Max Q Clear Time (g_c+10, s)	9.5	15.8	36.7	13.7	20.6	5.5	47.8					
Green Ext Time (p_c), s	0.0	0.5	0.2	2.2	0.3	1.0	0.0	4.5				

### Intersection Summary

HCM 6th Ctrl Delay 42.8

HCM 6th LOS D

### Notes



























\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way






























The Ranch  
Cumulative Plus Phase 1 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	40	760	336	299	970	310	509	412	139	390	596	30
Future Volume (veh/h)	40	760	336	299	970	310	509	412	139	390	596	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	43	826	112	325	1054	129	553	448	128	424	648	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	55	1192	160	351	1971	241	549	738	209	483	872	40
Arrive On Green	0.03	0.26	0.26	0.20	0.43	0.43	0.16	0.27	0.26	0.14	0.25	0.24
Sat Flow, veh/h	1795	4551	612	1781	4602	562	3483	2739	775	3483	3480	161
Grp Volume(v), veh/h	43	621	317	325	779	404	553	291	285	424	333	345
Grp Sat Flow(s),veh/h/ln	1795	1716	1733	1781	1702	1760	1742	1791	1723	1742	1791	1850
Q Serve(g_s), s	2.9	19.7	19.9	21.6	20.5	20.5	19.0	17.1	17.5	14.4	20.7	20.7
Cycle Q Clear(g_c), s	2.9	19.7	19.9	21.6	20.5	20.5	19.0	17.1	17.5	14.4	20.7	20.7
Prop In Lane	1.00		0.35	1.00		0.32	1.00		0.45	1.00		0.09
Lane Grp Cap(c), veh/h	55	899	454	351	1458	754	549	483	464	483	449	464
V/C Ratio(X)	0.78	0.69	0.70	0.93	0.53	0.54	1.01	0.60	0.61	0.88	0.74	0.74
Avail Cap(c_a), veh/h	89	1081	546	399	1666	861	549	579	557	578	594	614
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.0	40.1	40.2	47.5	25.6	25.6	50.8	38.4	38.8	50.9	41.6	41.7
Incr Delay (d2), s/veh	8.4	1.0	2.1	24.3	0.1	0.2	40.3	0.5	0.6	11.3	2.2	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	8.1	8.5	11.6	7.9	8.2	11.1	7.3	7.3	6.9	9.1	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.4	41.1	42.3	71.8	25.7	25.8	91.1	38.9	39.4	62.2	43.8	43.8
LnGrp LOS	E	D	D	E	C	C	F	D	D	E	D	D
Approach Vol, veh/h		981			1508			1129			1102	
Approach Delay, s/veh		42.6			35.6			64.6			50.9	
Approach LOS		D			D			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.7	36.5	27.8	35.6	23.0	34.2	7.7	55.6				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+I1), s	16.4	19.5	23.6	21.9	21.0	22.7	4.9	22.5				
Green Ext Time (p_c), s	0.3	1.9	0.2	3.3	0.0	2.1	0.0	5.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				47.6								
HCM 6th LOS				D								

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 		 	 	
Traffic Volume (veh/h)	321	951	120	110	1220	310	300	495	260	480	223	322
Future Volume (veh/h)	321	951	120	110	1220	310	300	495	260	480	223	322
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	338	1001	49	116	1284	133	316	521	212	505	235	192
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	238	1915	94	145	1694	523	222	663	269	358	882	386
Arrive On Green	0.13	0.38	0.38	0.08	0.33	0.33	0.12	0.27	0.25	0.10	0.25	0.25
Sat Flow, veh/h	1781	4983	244	1781	5106	1578	1795	2486	1007	3483	3582	1568
Grp Volume(v), veh/h	338	683	367	116	1284	133	316	375	358	505	235	192
Grp Sat Flow(s),veh/h/ln	1781	1702	1822	1781	1702	1578	1795	1791	1702	1742	1791	1568
Q Serve(g_s), s	13.0	15.0	15.1	6.2	21.8	6.0	12.0	18.8	19.0	10.0	5.1	10.2
Cycle Q Clear(g_c), s	13.0	15.0	15.1	6.2	21.8	6.0	12.0	18.8	19.0	10.0	5.1	10.2
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.59	1.00		1.00
Lane Grp Cap(c), veh/h	238	1308	700	145	1694	523	222	478	454	358	882	386
V/C Ratio(X)	1.42	0.52	0.52	0.80	0.76	0.25	1.43	0.78	0.79	1.41	0.27	0.50
Avail Cap(c_a), veh/h	238	1692	906	202	2433	752	222	824	783	358	1574	689
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.1	23.0	23.1	43.9	29.0	23.7	42.6	33.0	33.5	43.6	29.5	31.4
Incr Delay (d2), s/veh	211.1	0.1	0.2	9.9	0.4	0.1	215.5	1.1	1.2	199.9	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.4	5.6	6.0	3.0	8.4	2.1	18.4	7.8	7.6	14.1	2.1	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	253.2	23.2	23.3	53.8	29.4	23.8	258.1	34.1	34.6	243.5	29.6	31.8
LnGrp LOS	F	C	C	D	C	C	F	C	C	F	C	C
Approach Vol, veh/h		1388			1533			1049			932	
Approach Delay, s/veh		79.2			30.8			101.8			146.0	
Approach LOS		E			C			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	29.9	11.9	41.3	16.0	27.9	17.0	36.2				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	10.0	43.4	11.0	47.0	12.0	41.4	13.0	45.0				
Max Q Clear Time (g_c+I1), s	12.0	21.0	8.2	17.1	14.0	12.2	15.0	23.8				
Green Ext Time (p_c), s	0.0	2.6	0.0	4.4	0.0	1.2	0.0	6.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			81.6									
HCM 6th LOS			F									

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1807	850	290	1502	0	0	0	0	790	10	920
Future Volume (veh/h)	0	1807	850	290	1502	0	0	0	0	790	10	920
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1964	456	315	1633	0				867	0	972
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	1	1	0				2	2	2
Cap, veh/h	0	1691	524	226	2426	0				1680	0	747
Arrive On Green	0.00	0.33	0.33	0.11	0.47	0.00				0.47	0.00	0.47
Sat Flow, veh/h	0	5316	1596	1975	5316	0				3563	0	1585
Grp Volume(v), veh/h	0	1964	456	315	1633	0				867	0	972
Grp Sat Flow(s),veh/h/ln	0	1716	1596	987	1716	0				1781	0	1585
Q Serve(g_s), s	0.0	46.0	37.6	16.0	34.4	0.0				23.8	0.0	66.0
Cycle Q Clear(g_c), s	0.0	46.0	37.6	16.0	34.4	0.0				23.8	0.0	66.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1691	524	226	2426	0				1680	0	747
V/C Ratio(X)	0.00	1.16	0.87	1.40	0.67	0.00				0.52	0.00	1.30
Avail Cap(c_a), veh/h	0	1691	524	226	2426	0				1680	0	747
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	47.0	44.2	62.0	28.6	0.0				25.8	0.0	37.0
Incr Delay (d2), s/veh	0.0	79.6	14.0	202.7	0.6	0.0				0.1	0.0	145.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	31.4	16.4	10.3	13.7	0.0				9.8	0.0	54.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	126.6	58.2	264.7	29.3	0.0				26.0	0.0	182.1
LnGrp LOS	A	F	E	F	C	A				C	A	F
Approach Vol, veh/h		2420			1948						1839	
Approach Delay, s/veh		113.7			67.3						108.5	
Approach LOS		F			E						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	30.0	50.0		70.0		70.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	60.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I1), s	11.0	48.0		68.0		36.4						
Green Ext Time (p_c), s	0.0	0.0		0.0		8.8						

### Intersection Summary

HCM 6th Ctrl Delay 97.6  
HCM 6th LOS F

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1927	670	170	1032	620	760	50	930	0	0	0
Future Volume (veh/h)	0	1927	670	170	1032	620	760	50	930	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	0	2095	449	185	1122	321	865	0	876			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2			
Cap, veh/h	0	2042	633	163	2681	809	1455	0	647			
Arrive On Green	0.00	0.40	0.40	0.09	0.52	0.52	0.41	0.00	0.41			
Sat Flow, veh/h	0	5274	1583	1781	5106	1540	3563	0	1584			
Grp Volume(v), veh/h	0	2095	449	185	1122	321	865	0	876			
Grp Sat Flow(s), veh/h/ln	0	1702	1583	1781	1702	1540	1781	0	1584			
Q Serve(g_s), s	0.0	48.0	28.5	11.0	16.1	15.0	22.8	0.0	49.0			
Cycle Q Clear(g_c), s	0.0	48.0	28.5	11.0	16.1	15.0	22.8	0.0	49.0			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2042	633	163	2681	809	1455	0	647			
V/C Ratio(X)	0.00	1.03	0.71	1.13	0.42	0.40	0.59	0.00	1.35			
Avail Cap(c_a), veh/h	0	2042	633	163	2681	809	1455	0	647			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	36.0	30.2	54.5	17.3	17.1	27.7	0.0	35.5			
Incr Delay (d2), s/veh	0.0	26.8	3.2	110.6	0.0	0.1	0.5	0.0	169.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	23.7	10.8	9.8	5.9	5.0	9.3	0.0	48.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	62.8	33.3	165.1	17.4	17.2	28.2	0.0	205.0			
LnGrp LOS	A	F	C	F	B	B	C	A	F			
Approach Vol, veh/h	2544			1628			1741					
Approach Delay, s/veh	57.6			34.1			117.2					
Approach LOS	E			C			F					
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.0	52.0		53.0		67.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	1.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+I1), s	1.0	50.0		51.0		18.1						
Green Ext Time (p_c), s	0.0	0.0		0.0		6.2						

### Intersection Summary

HCM 6th Ctrl Delay	68.7
HCM 6th LOS	E

### Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	170	10	10	70	370	10	160	20	415	310	80
Future Volume (veh/h)	80	170	10	10	70	370	10	160	20	415	310	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.95	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	87	185	10	11	76	251	11	174	11	451	337	69
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	138	498	27	104	98	324	106	498	31	495	1074	217
Arrive On Green	0.08	0.28	0.28	0.06	0.27	0.27	0.06	0.15	0.13	0.28	0.36	0.34
Sat Flow, veh/h	1781	1757	95	1767	370	1223	1795	3411	214	1795	2961	598
Grp Volume(v), veh/h	87	0	195	11	0	327	11	91	94	451	202	204
Grp Sat Flow(s),veh/h/ln	1781	0	1851	1767	0	1593	1795	1791	1834	1795	1791	1768
Q Serve(g_s), s	3.2	0.0	5.7	0.4	0.0	12.9	0.4	3.1	3.2	16.5	5.5	5.7
Cycle Q Clear(g_c), s	3.2	0.0	5.7	0.4	0.0	12.9	0.4	3.1	3.2	16.5	5.5	5.7
Prop In Lane	1.00		0.05	1.00		0.77	1.00		0.12	1.00		0.34
Lane Grp Cap(c), veh/h	138	0	525	104	0	423	106	262	268	495	650	642
V/C Ratio(X)	0.63	0.00	0.37	0.11	0.00	0.77	0.10	0.35	0.35	0.91	0.31	0.32
Avail Cap(c_a), veh/h	289	0	981	286	0	844	555	1345	1377	555	1345	1328
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	19.5	30.3	0.0	23.1	30.3	26.1	26.2	23.8	15.5	15.8
Incr Delay (d2), s/veh	1.8	0.0	0.2	0.2	0.0	1.2	0.2	0.3	0.3	17.1	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	2.2	0.2	0.0	4.4	0.2	1.2	1.3	8.4	1.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.2	0.0	19.6	30.4	0.0	24.2	30.4	26.4	26.5	40.9	15.6	15.9
LnGrp LOS	C	A	B	C	A	C	C	C	C	D	B	B
Approach Vol, veh/h	282				338		196				857	
Approach Delay, s/veh	23.5				24.4		26.6				29.0	
Approach LOS	C				C		C				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	2.7	13.9	8.0	23.3	8.0	28.6	9.3	22.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	1.0	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+I1), s	1.0	5.2	2.4	7.7	2.4	7.7	5.2	14.9				
Green Ext Time (p_c), s	0.2	0.6	0.0	0.6	0.0	1.4	0.0	1.2				

## Intersection Summary









HCM 6th Ctrl Delay	26.9
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	210	222	280	210	160	154	845	181	150	1204	140
Future Volume (veh/h)	140	210	222	280	210	160	154	845	181	150	1204	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	152	228	207	304	228	149	167	918	177	163	1309	143
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	180	243	220	303	355	232	137	967	186	183	1133	123
Arrive On Green	0.10	0.27	0.27	0.17	0.34	0.34	0.08	0.32	0.31	0.10	0.35	0.34
Sat Flow, veh/h	1795	903	820	1781	1047	684	1795	2992	577	1795	3249	353
Grp Volume(v), veh/h	152	0	435	304	0	377	167	549	546	163	719	733
Grp Sat Flow(s),veh/h/ln	1795	0	1723	1781	0	1731	1795	1791	1778	1795	1791	1811
Q Serve(g_s), s	9.8	0.0	29.0	20.0	0.0	21.6	9.0	35.2	35.3	10.5	41.0	41.0
Cycle Q Clear(g_c), s	9.8	0.0	29.0	20.0	0.0	21.6	9.0	35.2	35.3	10.5	41.0	41.0
Prop In Lane	1.00		0.48	1.00		0.40	1.00		0.32	1.00		0.19
Lane Grp Cap(c), veh/h	180	0	463	303	0	587	137	579	575	183	624	631
V/C Ratio(X)	0.85	0.00	0.94	1.00	0.00	0.64	1.22	0.95	0.95	0.89	1.15	1.16
Avail Cap(c_a), veh/h	229	0	498	303	0	587	137	579	575	183	624	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	0.0	42.1	48.8	0.0	32.9	54.3	38.9	39.1	52.1	38.3	38.4
Incr Delay (d2), s/veh	16.9	0.0	24.4	52.6	0.0	1.9	146.0	25.1	25.4	36.4	85.3	89.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.0	15.0	13.0	0.0	9.0	9.5	18.7	18.7	6.5	31.8	32.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.0	0.0	66.5	101.4	0.0	34.7	200.3	63.9	64.5	88.6	123.6	127.9
LnGrp LOS	E	A	E	F	A	C	F	E	E	F	F	F
Approach Vol, veh/h	587		681			1262			1615			
Approach Delay, s/veh	67.1		64.5			82.2			122.0			
Approach LOS	E		E			F			F			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	42.0	24.0	35.6	13.0	45.0	15.8	43.8					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	36.7	20.0	34.0	9.0	39.7	15.0	39.0					
Max Q Clear Time (g_c+I1), s	37.3	22.0	31.0	11.0	43.0	11.8	23.6					
Green Ext Time (p_c), s	0.0	0.0	0.0	0.5	0.0	0.0	0.1	1.2				

### Intersection Summary










HCM 6th Ctrl Delay	92.7
HCM 6th LOS	F

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	0	6	50	0	170	2	1115	70	360	1106	51
Future Volume (veh/h)	98	0	6	50	0	170	2	1115	70	360	1106	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	0	1900	1870	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	107	0	7	54	0	7	2	1212	42	391	1202	55
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	0	0	2	1	1	1	1	1
Cap, veh/h	278	0	165	0	0	0	321	1541	670	442	2615	120
Arrive On Green	0.10	0.00	0.10	0.00	0.00	0.00	0.43	0.43	0.43	0.25	0.75	0.73
Sat Flow, veh/h	1409	0	1585		0		442	3582	1557	1795	3488	159
Grp Volume(v), veh/h	107	0	7		0.0		2	1212	42	391	617	640
Grp Sat Flow(s),veh/h/ln	1409	0	1585				442	1791	1557	1795	1791	1856
Q Serve(g_s), s	4.0	0.0	0.2				0.1	16.0	0.9	11.5	7.2	7.3
Cycle Q Clear(g_c), s	4.0	0.0	0.2				0.1	16.0	0.9	11.5	7.2	7.3
Prop In Lane	1.00		1.00				1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	278	0	165				321	1541	670	442	1343	1392
V/C Ratio(X)	0.38	0.00	0.04				0.01	0.79	0.06	0.88	0.46	0.46
Avail Cap(c_a), veh/h	1005	0	983				373	1960	852	459	1568	1626
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	0.0	22.3				8.9	13.4	9.1	19.9	2.6	2.6
Incr Delay (d2), s/veh	0.9	0.0	0.1				0.0	1.3	0.0	17.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.1				0.0	5.0	0.2	6.0	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	0.0	22.4				8.9	14.7	9.2	36.9	2.7	2.7
LnGrp LOS	C	A	C				A	B	A	D	A	A
Approach Vol, veh/h	114						1256			1648		
Approach Delay, s/veh	24.5						14.5			10.8		
Approach LOS	C						B			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	7.5	27.6	9.7		45.1							
Change Period (Y+Rc), s	4.0	5.3	4.5		5.3							
Max Green Setting (Gmax), s	4.0	28.7	33.5		46.7							
Max Q Clear Time (g_c+I13.5	18.0	18.0	6.0		9.3							
Green Ext Time (p_c), s	0.0	4.2	0.3		5.4							

### Intersection Summary

HCM 6th Ctrl Delay	12.9
HCM 6th LOS	B













# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	80	19	90	94	451	11	461	70	570	696	35
Future Volume (veh/h)	54	80	19	90	94	451	11	461	70	570	696	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	59	87	21	98	102	72	12	501	66	620	757	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	123	150	127	158	205	134	22	806	106	820	1650	81
Arrive On Green	0.07	0.08	0.08	0.09	0.10	0.10	0.01	0.25	0.22	0.24	0.47	0.45
Sat Flow, veh/h	1810	1900	1605	1795	2075	1353	1810	3203	420	3483	3476	170
Grp Volume(v), veh/h	59	87	21	98	87	87	12	281	286	620	390	404
Grp Sat Flow(s),veh/h/ln	1810	1900	1605	1795	1791	1637	1810	1805	1818	1742	1791	1855
Q Serve(g_s), s	1.5	2.0	0.6	2.4	2.1	2.3	0.3	6.4	6.5	7.7	6.8	6.8
Cycle Q Clear(g_c), s	1.5	2.0	0.6	2.4	2.1	2.3	0.3	6.4	6.5	7.7	6.8	6.8
Prop In Lane	1.00		1.00	1.00		0.83	1.00		0.23	1.00		0.09
Lane Grp Cap(c), veh/h	123	150	127	158	177	162	22	454	458	820	850	880
V/C Ratio(X)	0.48	0.58	0.17	0.62	0.49	0.54	0.54	0.62	0.62	0.76	0.46	0.46
Avail Cap(c_a), veh/h	665	1766	1491	427	1432	1309	196	1287	1296	2785	2516	2605
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.8	20.6	19.9	20.3	19.7	19.8	22.7	15.3	15.5	16.5	8.2	8.2
Incr Delay (d2), s/veh	2.8	1.3	0.2	3.9	0.8	1.0	7.2	0.5	0.5	0.5	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.8	0.2	1.0	0.8	0.8	0.2	2.1	2.1	2.7	2.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.6	21.9	20.1	24.2	20.5	20.9	30.0	15.9	16.0	17.0	8.3	8.3
LnGrp LOS	C	C	C	C	C	C	C	B	B	B	A	A
Approach Vol, veh/h	167		272			579			1414			
Approach Delay, s/veh	22.3		22.0			16.2			12.1			
Approach LOS	C		C			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), \$4.9	15.6	8.1	7.7	4.6	26.0	7.2	8.6					
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0				
Max Green Setting (Gmax), s	37.0	31.7	10.5	43.0	5.0	63.7	16.5	37.0				
Max Q Clear Time (g_c+19.0), s	19.0	8.5	4.4	4.0	2.3	8.8	3.5	4.3				
Green Ext Time (p_c), s	1.2	1.9	0.1	0.3	0.0	3.5	0.1	0.6				

### Intersection Summary

HCM 6th Ctrl Delay	14.9
HCM 6th LOS	B











# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	613	30	90	889	130	150	210	270	120	50	153
Future Volume (veh/h)	114	613	30	90	889	130	150	210	270	120	50	153
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	124	666	29	98	966	130	163	228	92	130	54	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	1249	54	131	1084	146	199	828	324	165	589	467
Arrive On Green	0.09	0.36	0.36	0.07	0.34	0.34	0.11	0.33	0.33	0.09	0.31	0.31
Sat Flow, veh/h	1781	3469	151	1781	3148	423	1781	2495	976	1781	1885	1494
Grp Volume(v), veh/h	124	341	354	98	545	551	163	160	160	130	51	51
Grp Sat Flow(s),veh/h/ln	1781	1777	1843	1781	1777	1794	1781	1777	1695	1781	1777	1602
Q Serve(g_s), s	7.7	17.1	17.1	6.1	32.7	32.7	10.1	7.5	7.9	8.0	2.3	2.6
Cycle Q Clear(g_c), s	7.7	17.1	17.1	6.1	32.7	32.7	10.1	7.5	7.9	8.0	2.3	2.6
Prop In Lane	1.00		0.08	1.00		0.24	1.00		0.58	1.00		0.93
Lane Grp Cap(c), veh/h	158	640	663	131	612	618	199	590	563	165	556	501
V/C Ratio(X)	0.78	0.53	0.53	0.75	0.89	0.89	0.82	0.27	0.28	0.79	0.09	0.10
Avail Cap(c_a), veh/h	187	644	668	209	666	672	239	590	563	199	556	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.2	28.6	28.6	51.2	34.9	35.0	48.9	27.6	27.9	50.0	27.4	27.7
Incr Delay (d2), s/veh	16.6	0.8	0.8	8.3	13.5	13.4	16.9	1.1	1.3	15.9	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	7.1	7.4	2.9	15.6	15.8	5.3	3.2	3.3	4.2	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.8	29.4	29.4	59.5	48.4	48.4	65.8	28.8	29.1	65.9	27.7	28.1
LnGrp LOS	E	C	C	E	D	D	E	C	C	E	C	C
Approach Vol, veh/h	819			1194			483			232		
Approach Delay, s/veh	35.1			49.3			41.4			49.2		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	44.4	41.4	12.3	44.6	16.6	39.2	14.0	42.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	36.9	36.9	12.7	40.3	14.6	34.4	11.3	41.7				
Max Q Clear Time (g_c+10), s	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9				
Max Q Clear Time (g_c+10), s	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9				
Green Ext Time (p_c), s	0.1	1.7	0.1	3.8	0.1	0.5	0.0	3.6				

### Intersection Summary

HCM 6th Ctrl Delay 43.6

HCM 6th LOS D

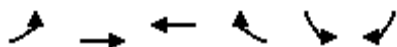
### Notes

User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour

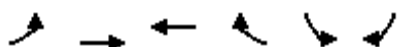


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	73	930	1055	880	310	54
Future Volume (veh/h)	73	930	1055	880	310	54
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	77	979	1111	453	326	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	115	2055	1611	719	1041	477
Arrive On Green	0.06	0.58	0.45	0.45	0.30	0.30
Sat Flow, veh/h	1781	3647	3647	1585	3456	1585
Grp Volume(v), veh/h	77	979	1111	453	326	16
Grp Sat Flow(s), veh/h/ln	1781	1777	1777	1585	1728	1585
Q Serve(g_s), s	2.8	10.6	16.5	14.5	4.8	0.5
Cycle Q Clear(g_c), s	2.8	10.6	16.5	14.5	4.8	0.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	115	2055	1611	719	1041	477
V/C Ratio(X)	0.67	0.48	0.69	0.63	0.31	0.03
Avail Cap(c_a), veh/h	215	3318	2676	1194	1041	477
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	8.1	14.4	13.9	17.9	16.4
Incr Delay (d2), s/veh	6.5	0.2	0.5	0.9	0.8	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.3	2.9	5.4	4.3	1.8	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	36.9	8.3	15.0	14.8	18.7	16.5
LnGrp LOS	D	A	B	B	B	B
Approach Vol, veh/h		1056	1564		342	
Approach Delay, s/veh		10.4	14.9		18.6	
Approach LOS		B	B		B	
Timer - Assigned Phs			4	6	7	8
Phs Duration (G+Y+Rc), s			42.4	24.0	8.3	34.1
Change Period (Y+Rc), s			4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s			61.5	19.5	7.5	49.5
Max Q Clear Time (g_c+I1), s			12.6	6.8	4.8	18.5
Green Ext Time (p_c), s			7.8	0.9	0.0	11.1
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			13.7			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary

## 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	349	1031	1831	570	960	184
Future Volume (veh/h)	349	1031	1831	570	960	184
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	367	1085	1927	392	1011	69
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	312	3617	1777	793	784	359
Arrive On Green	0.17	0.71	0.50	0.50	0.22	0.22
Sat Flow, veh/h	1781	5274	3647	1585	3483	1598
Grp Volume(v), veh/h	367	1085	1927	392	1011	69
Grp Sat Flow(s), veh/h/ln	1781	1702	1777	1585	1742	1598
Q Serve(g_s), s	21.0	9.4	60.0	19.7	27.0	4.2
Cycle Q Clear(g_c), s	21.0	9.4	60.0	19.7	27.0	4.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	312	3617	1777	793	784	359
V/C Ratio(X)	1.18	0.30	1.08	0.49	1.29	0.19
Avail Cap(c_a), veh/h	312	3617	1777	793	784	359
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	6.5	30.0	19.9	46.5	37.7
Incr Delay (d2), s/veh	108.1	0.0	48.3	0.2	140.0	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	2.8	35.2	6.9	26.5	1.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	157.6	6.5	78.3	20.1	186.5	37.8
LnGrp LOS	F	A	F	C	F	D
Approach Vol, veh/h		1452	2319		1080	
Approach Delay, s/veh		44.7	68.4		177.0	
Approach LOS		D	E		F	
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		89.0			25.0	64.0
Change Period (Y+Rc), s		5.3			4.5	5.3
Max Green Setting (Gmax), s		83.7			20.5	58.7
Max Q Clear Time (g_c+I1), s		11.4			23.0	62.0
Green Ext Time (p_c), s		5.3			0.0	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			85.5			
HCM 6th LOS			F			

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑↑			↑↑	↖	↖	↖	↖			
Traffic Volume (veh/h)	503	1488	0	0	1839	1170	562	10	220	0	0	0
Future Volume (veh/h)	503	1488	0	0	1839	1170	562	10	220	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	547	1617	0	0	2037	1012	619	0	192			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	407	3593	0	0	2031	861	767	0	341			
Arrive On Green	0.12	0.70	0.00	0.00	0.54	0.54	0.22	0.00	0.22			
Sat Flow, veh/h	3483	5316	0	0	3770	1598	3534	0	1572			
Grp Volume(v), veh/h	547	1617	0	0	2037	1012	619	0	192			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	11.0	13.0	0.0	0.0	50.7	50.7	15.6	0.0	10.3			
Cycle Q Clear(g_c), s	11.0	13.0	0.0	0.0	50.7	50.7	15.6	0.0	10.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	407	3593	0	0	2031	861	767	0	341			
V/C Ratio(X)	1.34	0.45	0.00	0.00	1.00	1.18	0.81	0.00	0.56			
Avail Cap(c_a), veh/h	407	3593	0	0	2031	861	1739	0	774			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	41.6	6.3	0.0	0.0	21.7	21.7	35.0	0.0	32.9			
Incr Delay (d2), s/veh	170.3	0.0	0.0	0.0	20.7	91.3	0.8	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.1	3.4	0.0	0.0	24.6	37.7	6.4	0.0	0.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	211.9	6.3	0.0	0.0	42.4	113.0	35.8	0.0	33.4			
LnGrp LOS	F	A	A	A	F	F	D	A	C			
Approach Vol, veh/h	2164			3049			811					
Approach Delay, s/veh	58.3			65.8			35.2					
Approach LOS	E			E			D					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	69.7			24.4		15.0	54.7					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	64.4			45.0		11.0	49.4					
Max Q Clear Time (g_c+l1), s	15.0			17.6		13.0	52.7					
Green Ext Time (p_c), s	9.5			1.5		0.0	0.0					

### Intersection Summary

HCM 6th Ctrl Delay 59.0




HCM 6th LOS E

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour

Intersection						
Int Delay, s/veh	179.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	120	529	53	50	489	125
Future Vol, veh/h	120	529	53	50	489	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	130	575	58	54	532	136
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1285	85	0	0	112	0
Stage 1	85	-	-	-	-	-
Stage 2	1200	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	183	980	-	-	1490	-
Stage 1	943	-	-	-	-	-
Stage 2	288	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 112	980	-	-	1490	-
Mov Cap-2 Maneuver	~ 112	-	-	-	-	-
Stage 1	943	-	-	-	-	-
Stage 2	177	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s\$	371.3	0		7		
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	403	1490	-	
HCM Lane V/C Ratio	-	-	1.75	0.357	-	
HCM Control Delay (s)	-	-	\$ 371.3	8.8	0	
HCM Lane LOS	-	-	F	A	A	
HCM 95th %tile Q(veh)	-	-	43.8	1.6	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

# HCM 6th Signalized Intersection Summary

## 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↰↰↰	↰	↰	↰↰	
Traffic Volume (veh/h)	340	1475	945	100	480	910	
Future Volume (veh/h)	340	1475	945	100	480	910	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1870	1870	1796	1796	
Adj Flow Rate, veh/h	370	1603	1027	0	522	605	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	1	1	2	2	7	7	
Cap, veh/h	419	1718	1682		787	1233	
Arrive On Green	0.12	0.48	0.33	0.00	0.46	0.46	
Sat Flow, veh/h	3483	3676	5274	1585	1711	2679	
Grp Volume(v), veh/h	370	1603	1027	0	522	605	
Grp Sat Flow(s),veh/h/ln	1742	1791	1702	1585	1711	1340	
Q Serve(g_s), s	15.7	63.2	25.3	0.0	35.6	23.6	
Cycle Q Clear(g_c), s	15.7	63.2	25.3	0.0	35.6	23.6	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	419	1718	1682		787	1233	
V/C Ratio(X)	0.88	0.93	0.61		0.66	0.49	
Avail Cap(c_a), veh/h	546	1898	1753		787	1233	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	64.9	36.7	42.2	0.0	31.4	28.2	
Incr Delay (d2), s/veh	10.9	8.2	0.4	0.0	1.7	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	7.5	28.2	10.5	0.0	15.1	19.4	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	75.8	44.9	42.6	0.0	33.1	28.3	
LnGrp LOS	E	D	D		C	C	
Approach Vol, veh/h		1973	1027	A	1127		
Approach Delay, s/veh		50.7	42.6		30.6		
Approach LOS		D	D		C		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				76.5	73.5	22.6	53.9
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				79.5	61.5	23.5	51.5
Max Q Clear Time (g_c+I1), s				65.2	37.6	17.7	27.3
Green Ext Time (p_c), s				6.7	2.4	0.4	4.6

### Intersection Summary

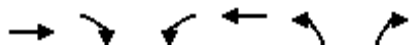
HCM 6th Ctrl Delay	43.2
HCM 6th LOS	D

### Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour














Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	1235	727	0	1663	152	30
Future Volume (veh/h)	1235	727	0	1663	152	30
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1342	590	0	1808	165	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	2089	932	0	2089	1240	569
Arrive On Green	0.59	0.59	0.00	0.59	0.36	0.36
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1342	590	0	1808	165	4
Grp Sat Flow(s),veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	37.5	36.6	0.0	64.0	4.8	0.2
Cycle Q Clear(g_c), s	37.5	36.6	0.0	64.0	4.8	0.2
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2089	932	0	2089	1240	569
V/C Ratio(X)	0.64	0.63	0.00	0.87	0.13	0.01
Avail Cap(c_a), veh/h	2748	1226	0	2748	1240	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	20.3	0.0	25.9	32.4	30.9
Incr Delay (d2), s/veh	0.3	0.7	0.0	2.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	13.6	0.0	25.8	2.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.8	21.0	0.0	28.4	32.6	30.9
LnGrp LOS	C	C	A	C	C	C
Approach Vol, veh/h	1932			1808	169	
Approach Delay, s/veh	20.9			28.4	32.6	
Approach LOS	C			C	C	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	57.8			92.2		92.2
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	25.5			115.5		115.5
Max Q Clear Time (g_c+I1), s	6.8			39.5		66.0
Green Ext Time (p_c), s	0.5			22.7		21.7
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			24.8			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Cumulative Plus Phase 1 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	271	60	60	20	50	20	30	454	20	20	303	160
Future Volume (veh/h)	271	60	60	20	50	20	30	454	20	20	303	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	295	65	65	22	54	22	33	493	22	22	329	174
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	450	381	72	170	69	93	894	399	72	853	380
Arrive On Green	0.15	0.24	0.24	0.04	0.13	0.12	0.05	0.25	0.25	0.04	0.24	0.24
Sat Flow, veh/h	1781	1870	1585	1781	1263	515	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	295	65	65	22	0	76	33	493	22	22	329	174
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1778	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.5	1.0	1.2	0.4	0.0	1.5	0.7	4.5	0.4	0.4	2.9	3.5
Cycle Q Clear(g_c), s	5.5	1.0	1.2	0.4	0.0	1.5	0.7	4.5	0.4	0.4	2.9	3.5
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	450	381	72	0	239	93	894	399	72	853	380
V/C Ratio(X)	1.13	0.14	0.17	0.30	0.00	0.32	0.36	0.55	0.06	0.30	0.39	0.46
Avail Cap(c_a), veh/h	261	923	782	261	0	877	261	1849	825	261	1849	825
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	11.2	11.3	17.5	0.0	14.7	17.2	12.2	10.6	17.5	11.9	12.2
Incr Delay (d2), s/veh	94.8	0.1	0.2	2.3	0.0	0.8	2.3	0.5	0.1	2.3	0.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	0.4	0.4	0.2	0.0	0.5	0.3	1.3	0.1	0.2	0.8	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	110.8	11.4	11.5	19.8	0.0	15.5	19.4	12.7	10.7	19.8	12.2	13.0
LnGrp LOS	F	B	B	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	425			98			548			525		
Approach Delay, s/veh	80.4			16.5			13.0			12.8		
Approach LOS	F			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.5	13.4	5.5	13.0	6.0	13.0	9.5	9.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+1/2), s	12.4	6.5	2.4	3.2	2.7	5.5	7.5	3.5				
Green Ext Time (p_c), s	0.0	2.4	0.0	0.4	0.0	2.1	0.0	0.2				

### Intersection Summary



















HCM 6th Ctrl Delay	31.1
HCM 6th LOS	C



# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour








												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	370	10	450	1093	943	0	0	796	530
Future Volume (veh/h)	0	0	0	370	10	450	1093	943	0	0	796	530
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	1885	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				402	11	430	1188	1025	0	0	865	576
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				1	1	1	1	1	0	0	1	1
Cap, veh/h				1014	0	465	1146	2330	0	0	1896	466
Arrive On Green				0.29	0.29	0.29	0.33	0.65	0.00	0.00	0.29	0.29
Sat Flow, veh/h				3483	0	1598	3483	3676	0	0	6749	1594
Grp Volume(v), veh/h				402	0	430	1188	1025	0	0	865	576
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1742	1791	0	0	1621	1594
Q Serve(g_s), s				12.7	0.0	35.7	45.0	19.2	0.0	0.0	14.9	40.0
Cycle Q Clear(g_c), s				12.7	0.0	35.7	45.0	19.2	0.0	0.0	14.9	40.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1014	0	465	1146	2330	0	0	1896	466
V/C Ratio(X)				0.40	0.00	0.92	1.04	0.44	0.00	0.00	0.46	1.24
Avail Cap(c_a), veh/h				1095	0	502	1146	2330	0	0	1896	466
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				38.9	0.0	47.1	45.9	11.7	0.0	0.0	39.5	48.4
Incr Delay (d2), s/veh				0.1	0.0	21.5	36.6	0.0	0.0	0.0	0.1	123.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.3	0.0	16.5	24.6	7.0	0.0	0.0	5.8	31.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				39.0	0.0	68.5	82.5	11.8	0.0	0.0	39.6	171.8
LnGrp LOS				D	A	E	F	B	A	A	D	F
Approach Vol, veh/h					832			2213			1441	
Approach Delay, s/veh					54.2			49.8			92.5	
Approach LOS					D			D			F	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	93.0			49.0			44.0			43.8		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	21.2			47.0			42.0			37.7		
Green Ext Time (p_c), s	4.9			0.0			0.0			0.8		
Intersection Summary												
HCM 6th Ctrl Delay	64.3											
HCM 6th LOS	E											

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								 				
Traffic Volume (veh/h)	460	10	785	0	0	0	0	1576	240	310	856	0
Future Volume (veh/h)	460	10	785	0	0	0	0	1576	240	310	856	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	500	0	860				0	1713	233	337	930	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1274	0	1133				0	2122	289	429	1876	0
Arrive On Green	0.35	0.00	0.35				0.00	0.37	0.35	0.12	0.52	0.00
Sat Flow, veh/h	3591	0	3195				0	6077	791	3483	3676	0
Grp Volume(v), veh/h	500	0	860				0	1433	513	337	930	0
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1621	1740	1742	1791	0
Q Serve(g_s), s	8.0	0.0	18.2				0.0	20.3	20.3	7.2	12.8	0.0
Cycle Q Clear(g_c), s	8.0	0.0	18.2				0.0	20.3	20.3	7.2	12.8	0.0
Prop In Lane	1.00		1.00				0.00		0.45	1.00		0.00
Lane Grp Cap(c), veh/h	1274	0	1133				0	1776	635	429	1876	0
V/C Ratio(X)	0.39	0.00	0.76				0.00	0.81	0.81	0.78	0.50	0.00
Avail Cap(c_a), veh/h	3992	0	3552				0	1908	683	592	2202	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.5	0.0	21.8				0.0	21.8	22.1	32.5	11.7	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.1				0.0	2.2	6.0	3.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	6.1				0.0	7.1	8.4	3.0	4.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.7	0.0	22.9				0.0	24.1	28.1	35.6	11.8	0.0
LnGrp LOS	B	A	C				A	C	C	D	B	A
Approach Vol, veh/h	1360						1946			1267		
Approach Delay, s/veh	21.3						25.2			18.1		
Approach LOS	C						C			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	3.4	31.9	31.1	45.3								
Change Period (Y+Rc), s	4.0	5.3	4.5	* 5.3								
Max Green Setting (Gmax), s	3.0	28.7	84.5	* 47								
Max Q Clear Time (g_c+19.2)	19.2	22.3	20.2	14.8								
Green Ext Time (p_c), s	0.3	4.3	6.4	4.2								

### Intersection Summary

HCM 6th Ctrl Delay	22.1
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.










\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	20	90	532	100	190	340	670	1371	60	790	60
Future Volume (veh/h)	30	20	90	532	100	190	340	670	1371	60	790	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	22	-35	578	109	156	370	728	708	65	859	62
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	48	0	367	758	138	197	415	1772	1373	98	1078	78
Arrive On Green	0.03	0.07	0.00	0.15	0.20	0.19	0.23	0.50	0.50	0.06	0.32	0.31
Sat Flow, veh/h	1781	1870	0	5023	696	996	1781	3554	2753	1781	3361	243
Grp Volume(v), veh/h	33	-13	-13	578	0	265	370	728	708	65	454	467
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1674	0	1691	1781	1777	1377	1781	1777	1827
Q Serve(g_s), s	1.3	0.0	0.0	8.0	0.0	10.8	14.5	9.3	12.6	2.6	16.9	16.9
Cycle Q Clear(g_c), s	1.3	0.0	0.0	8.0	0.0	10.8	14.5	9.3	12.6	2.6	16.9	16.9
Prop In Lane	1.00		0.00	1.00		0.59	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	48	0	0	758	0	335	415	1772	1373	98	570	586
V/C Ratio(X)	0.69	0.00	0.00	0.76	0.00	0.79	0.89	0.41	0.52	0.66	0.80	0.80
Avail Cap(c_a), veh/h	246	0	0	1388	0	1005	566	3290	2549	98	1179	1212
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.9	0.0	0.0	29.5	0.0	27.8	26.9	11.4	12.2	33.5	22.4	22.5
Incr Delay (d2), s/veh	6.5	0.0	0.0	0.6	0.0	1.6	10.6	0.1	0.1	12.3	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	3.0	0.0	4.1	6.7	3.0	3.1	1.4	6.3	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.4	0.0	0.0	30.1	0.0	29.4	37.4	11.5	12.4	45.8	23.4	23.4
LnGrp LOS	D	A	A	C	A	C	D	B	B	D	C	C
Approach Vol, veh/h	7			843			1806			986		
Approach Delay, s/veh	195.1			29.9			17.1			24.9		
Approach LOS	F			C			B			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	40.1	14.9	9.4	20.9	27.2	5.9	18.3				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	66.1	20.0	32.4	23.0	47.1	10.0	42.4				
Max Q Clear Time (g_c+14.6)	4.0	14.6	10.0	0.0	16.5	18.9	3.3	12.8				
Green Ext Time (p_c), s	0.0	5.2	0.9	0.0	0.3	3.4	0.0	0.9				

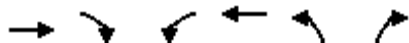
### Intersection Summary

HCM 6th Ctrl Delay	22.5
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour








Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	490	961	260	360	462	350
Future Volume (veh/h)	490	961	260	360	462	350
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	533	468	283	391	502	244
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	1367	606	425	1114	735	337
Arrive On Green	0.39	0.39	0.13	0.61	0.22	0.22
Sat Flow, veh/h	3589	1550	3401	1841	3401	1560
Grp Volume(v), veh/h	533	468	283	391	502	244
Grp Sat Flow(s), veh/h/ln	1749	1550	1700	1841	1700	1560
Q Serve(g_s), s	4.9	11.8	3.6	4.8	6.1	6.5
Cycle Q Clear(g_c), s	4.9	11.8	3.6	4.8	6.1	6.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1367	606	425	1114	735	337
V/C Ratio(X)	0.39	0.77	0.67	0.35	0.68	0.72
Avail Cap(c_a), veh/h	2735	1212	425	1834	1322	606
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.8	11.9	18.7	4.4	16.1	16.3
Incr Delay (d2), s/veh	0.1	0.8	3.9	0.1	0.4	1.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.3	2.8	1.4	0.7	2.1	1.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	9.9	12.7	22.6	4.5	16.6	17.4
LnGrp LOS	A	B	C	A	B	B
Approach Vol, veh/h	1001			674	746	
Approach Delay, s/veh	11.2			12.1	16.8	
Approach LOS	B			B	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		13.7	9.6	21.5		31.1
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		17.4	5.1	34.4		44.0
Max Q Clear Time (g_c+I1), s		8.5	5.6	13.8		6.8
Green Ext Time (p_c), s		1.2	0.0	2.9		1.3
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			13.2			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	20	1099	0	0	0	0	2111	416	200	782	0
Future Volume (veh/h)	270	20	1099	0	0	0	0	2111	416	200	782	0
Initial Q (Qb), veh	0	0	20				0	20	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	293	22	1092				0	2295	426	217	850	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1347	0	1279				0	2104	122	268	2850	0
Arrive On Green	0.34	0.34	0.34				0.00	0.48	0.47	0.08	0.60	0.00
Sat Flow, veh/h	3483	0	3643				0	5090	797	3483	5316	0
Grp Volume(v), veh/h	293	0	1092				0	1791	930	217	850	0
Grp Sat Flow(s),veh/h/ln	1742	0	1214				0	1131	1740	1742	1716	0
Q Serve(g_s), s	7.5	0.0	34.9				0.0	59.0	59.0	7.5	9.8	0.0
Cycle Q Clear(g_c), s	7.5	0.0	34.9				0.0	59.0	59.0	7.5	9.8	0.0
Prop In Lane	1.00		1.00				0.00		0.46	1.00		0.00
Lane Grp Cap(c), veh/h	1347	0	1279				0	1446	781	268	2850	0
V/C Ratio(X)	0.22	0.00	0.85				0.00	1.24	1.19	0.81	0.30	0.00
Avail Cap(c_a), veh/h	1586	0	1658				0	1627	834	368	3180	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.5	0.0	39.2				0.0	39.7	39.8	61.1	16.2	0.0
Incr Delay (d2), s/veh	0.0	0.0	2.9				0.0	113.7	98.4	6.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	12.0				0.0	37.4	23.1	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	13.0				0.0	35.8	51.6	3.8	4.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.6	0.0	54.1				0.0	190.8	161.3	67.5	16.2	0.0
LnGrp LOS	C	A	D				A	F	F	E	B	A
Approach Vol, veh/h	1385						2721			1067		
Approach Delay, s/veh	48.5						180.7			26.6		
Approach LOS	D						F			C		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	4.6	63.0	45.5	77.6								
Change Period (Y+Rc), s	4.9	* 4.9	5.3	4.9								
Max Green Setting (Gmax), s	58.0	* 58	54.7	75.1								
Max Q Clear Time (g_c+I), s	19.5	61.0	36.9	11.8								
Green Ext Time (p_c), s	0.1	0.0	3.2	3.9								

### Intersection Summary

HCM 6th Ctrl Delay 113.5  
HCM 6th LOS F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	40	30	30	220	40	260	40	1786	170	180	891	30
Future Volume (veh/h)	40	30	30	220	40	260	40	1786	170	180	891	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	43	33	-49	239	43	137	43	1941	177	196	968	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	58	45	90	282	296	250	56	1954	175	252	2229	74
Arrive On Green	0.06	0.06	0.00	0.16	0.16	0.16	0.03	0.59	0.58	0.07	0.63	0.63
Sat Flow, veh/h	1037	796	1598	1795	1885	1595	1795	3320	298	3483	3538	117
Grp Volume(v), veh/h	76	0	-49	239	43	137	43	1032	1086	196	490	510
Grp Sat Flow(s), veh/h/ln	1833	0	1598	1795	1885	1595	1795	1791	1827	1742	1791	1864
Q Serve(g_s), s	5.2	0.0	0.0	16.5	2.5	10.1	3.0	71.3	75.0	7.0	17.8	17.8
Cycle Q Clear(g_c), s	5.2	0.0	0.0	16.5	2.5	10.1	3.0	71.3	75.0	7.0	17.8	17.8
Prop In Lane	0.57		1.00	1.00		1.00	1.00		0.16	1.00		0.06
Lane Grp Cap(c), veh/h	103	0	90	282	296	250	56	1054	1075	252	1128	1174
V/C Ratio(X)	0.74	0.00	-0.54	0.85	0.15	0.55	0.77	0.98	1.01	0.78	0.43	0.43
Avail Cap(c_a), veh/h	504	0	439	535	562	476	225	1054	1075	437	1128	1174
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.2	0.0	0.0	52.2	46.3	49.5	61.3	25.4	26.3	58.1	12.0	12.0
Incr Delay (d2), s/veh	3.8	0.0	0.0	2.7	0.1	0.7	8.2	22.6	29.9	2.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	7.5	1.2	4.0	1.5	33.4	37.7	3.2	6.9	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.0	0.0	0.0	55.0	46.4	50.2	69.5	48.0	56.2	60.0	12.1	12.1
LnGrp LOS	E	A	A	D	D	D	E	D	F	E	B	B
Approach Vol, veh/h		27			419			2161			1196	
Approach Delay, s/veh		177.2			52.5			52.5			20.0	
Approach LOS		F			D			D			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.2	79.0		11.2	7.9	84.3		24.0				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+19.0), s	19.0	77.0		7.2	5.0	19.8		18.5				
Green Ext Time (p_c), s	0.2	0.0		0.2	0.0	4.8		0.6				

### Intersection Summary

HCM 6th Ctrl Delay	43.2
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	150	90	90	200	900	100	1026	30	540	971	150
Future Volume (veh/h)	160	150	90	90	200	900	100	1026	30	540	971	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	174	163	52	98	217	978	109	1115	30	587	1055	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	196	864	267	118	523	1456	294	1164	31	635	1206	692
Arrive On Green	0.11	0.32	0.32	0.07	0.28	0.27	0.16	0.33	0.32	0.18	0.34	0.33
Sat Flow, veh/h	1795	2694	832	1795	1885	3195	1795	3563	96	3483	3582	1576
Grp Volume(v), veh/h	174	107	108	98	217	978	109	560	585	587	1055	98
Grp Sat Flow(s), veh/h/ln	1795	1791	1735	1795	1885	1598	1795	1791	1868	1742	1791	1576
Q Serve(g_s), s	14.6	6.6	7.0	8.3	14.4	36.8	8.3	46.9	47.0	25.4	42.4	3.1
Cycle Q Clear(g_c), s	14.6	6.6	7.0	8.3	14.4	36.8	8.3	46.9	47.0	25.4	42.4	3.1
Prop In Lane	1.00		0.48	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	196	574	556	118	523	1456	294	585	610	635	1206	692
V/C Ratio(X)	0.89	0.19	0.19	0.83	0.42	0.67	0.37	0.96	0.96	0.92	0.87	0.14
Avail Cap(c_a), veh/h	258	842	816	129	751	1843	294	585	610	705	1638	882
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.2	37.6	37.8	70.6	45.2	32.7	57.0	50.5	50.6	61.5	47.7	10.7
Incr Delay (d2), s/veh	20.6	0.1	0.1	29.4	0.2	0.3	0.3	26.8	26.2	16.2	3.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	2.9	3.0	4.7	6.7	13.9	3.7	24.8	25.8	12.7	19.5	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.8	37.6	37.9	100.0	45.4	33.0	57.3	77.3	76.7	77.8	51.1	10.8
LnGrp LOS	F	D	D	F	D	C	E	E	E	E	D	B
Approach Vol, veh/h					1293		1254		1740			
Approach Delay, s/veh					40.2		75.3		57.8			
Approach LOS					D		E		E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	31.9	54.0	14.1	53.1	30.4	55.5	20.7	46.4				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	31.0	48.7	11.0	71.4	11.0	* 69	22.0	60.4				
Max Q Clear Time (g_c+27.4)	27.4	49.0	10.3	9.0	10.3	44.4	16.6	38.8				
Green Ext Time (p_c), s	0.5	0.0	0.0	0.7	0.0	5.8	0.1	3.1				

### Intersection Summary

HCM 6th Ctrl Delay 57.8

HCM 6th LOS E

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

The Ranch

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	720	310	906	10	150	90	843	1396	20	80	911	170
Future Volume (veh/h)	720	310	906	10	150	90	843	1396	20	80	911	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	542	628	140	11	158	27	887	1469	10	84	959	162
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	381	400	677	14	196	179	839	1656	720	107	1214	204
Arrive On Green	0.21	0.21	0.21	0.11	0.11	0.11	0.24	0.46	0.46	0.06	0.27	0.27
Sat Flow, veh/h	1795	1885	3195	122	1757	1598	3483	3582	1557	1795	4425	745
Grp Volume(v), veh/h	542	628	140	169	0	27	887	1469	10	84	743	378
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1879	0	1598	1742	1791	1557	1795	1716	1739
Q Serve(g_s), s	22.0	22.0	3.7	9.1	0.0	1.6	25.0	38.8	0.4	4.8	20.8	20.9
Cycle Q Clear(g_c), s	22.0	22.0	3.7	9.1	0.0	1.6	25.0	38.8	0.4	4.8	20.8	20.9
Prop In Lane	1.00		1.00	0.07		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	381	400	677	210	0	179	839	1656	720	107	942	477
V/C Ratio(X)	1.42	1.57	0.21	0.80	0.00	0.15	1.06	0.89	0.01	0.78	0.79	0.79
Avail Cap(c_a), veh/h	381	400	677	706	0	600	839	1863	810	156	1256	637
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.9	40.9	33.7	45.0	0.0	41.6	39.4	25.4	15.1	48.1	34.9	35.0
Incr Delay (d2), s/veh	205.7	269.1	0.1	2.7	0.0	0.1	47.3	4.8	0.0	8.5	1.7	3.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	39.6	1.4	4.3	0.0	0.6	15.6	16.0	0.1	2.4	8.8	9.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	246.6	310.0	33.8	47.7	0.0	41.8	86.7	30.2	15.1	56.7	36.6	38.5
LnGrp LOS	F	F	C	D	A	D	F	C	B	E	D	D
Approach Vol, veh/h	1310			196			2366			1205		
Approach Delay, s/veh	254.2			46.9			51.3			38.6		
Approach LOS	F			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	52.0			26.0	29.0	33.2		15.6				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	52.7			21.1	25.0	* 37		39.0				
Max Q Clear Time (g_c+10), s	40.8			24.0	27.0	22.9		11.1				
Green Ext Time (p_c), s	0.0	5.5		0.0	0.0	4.7		0.5				

### Intersection Summary

HCM 6th Ctrl Delay 100.5

HCM 6th LOS F

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.















# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1042	205	200	1379	80	330	150	180	70	180	120
Future Volume (veh/h)	50	1042	205	200	1379	80	330	150	180	70	180	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	54	1133	155	217	1499	54	359	163	74	76	196	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	70	1333	587	252	1697	741	432	495	417	98	279	72
Arrive On Green	0.04	0.37	0.37	0.14	0.47	0.47	0.12	0.26	0.26	0.05	0.19	0.18
Sat Flow, veh/h	1795	3582	1577	1795	3582	1563	3483	1885	1588	1795	1441	375
Grp Volume(v), veh/h	54	1133	155	217	1499	54	359	163	74	76	0	247
Grp Sat Flow(s),veh/h/ln	1795	1791	1577	1795	1791	1563	1742	1885	1588	1795	0	1815
Q Serve(g_s), s	2.8	27.4	6.4	11.1	35.7	1.8	9.5	6.6	3.4	3.9	0.0	12.0
Cycle Q Clear(g_c), s	2.8	27.4	6.4	11.1	35.7	1.8	9.5	6.6	3.4	3.9	0.0	12.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	70	1333	587	252	1697	741	432	495	417	98	0	351
V/C Ratio(X)	0.77	0.85	0.26	0.86	0.88	0.07	0.83	0.33	0.18	0.78	0.00	0.70
Avail Cap(c_a), veh/h	324	2016	888	324	2016	880	518	901	759	172	0	771
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.8	27.1	20.6	39.6	22.4	13.5	40.3	28.0	26.8	43.9	0.0	35.6
Incr Delay (d2), s/veh	6.6	1.5	0.1	14.0	3.9	0.0	8.1	0.1	0.1	4.9	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	10.9	2.2	5.6	14.1	0.6	4.4	2.8	1.2	1.8	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.5	28.6	20.7	53.6	26.4	13.5	48.4	28.2	26.9	48.8	0.0	36.6
LnGrp LOS	D	C	C	D	C	B	D	C	C	D	A	D
Approach Vol, veh/h	1342			1770			596			323		
Approach Delay, s/veh	28.6			29.3			40.2			39.4		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	28.7	17.2	39.0	15.7	22.2	7.7	48.6				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	9.0	43.7	17.0	* 53	14.0	38.7	17.0	* 53				
Max Q Clear Time (g_c+15, s)	9.0	8.6	13.1	29.4	11.5	14.0	4.8	37.7				
Green Ext Time (p_c), s	0.0	0.6	0.1	5.5	0.2	0.8	0.0	6.5				

### Intersection Summary

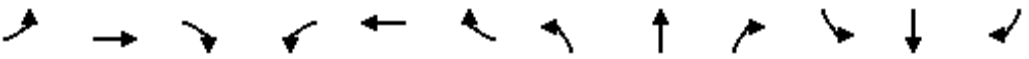
HCM 6th Ctrl Delay	31.5
HCM 6th LOS	C

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary 10: Deer Valley Road & Lone Tree Way






























The Ranch  
Cumulative Plus Phase 1 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰↰		↰	↰↰↰		↰↰	↰↰		↰↰	↰↰	
Traffic Volume (veh/h)	40	760	336	299	970	310	509	412	139	390	596	30
Future Volume (veh/h)	40	760	336	299	970	310	509	412	139	390	596	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	43	826	88	325	1054	146	553	448	91	424	648	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	55	1207	128	359	1944	269	496	732	148	494	865	35
Arrive On Green	0.03	0.25	0.25	0.20	0.42	0.42	0.14	0.25	0.23	0.14	0.24	0.23
Sat Flow, veh/h	1810	4746	503	1810	4606	637	3510	2983	601	3510	3536	142
Grp Volume(v), veh/h	43	600	314	325	791	409	553	270	269	424	331	343
Grp Sat Flow(s),veh/h/ln	1810	1729	1791	1810	1729	1785	1755	1805	1780	1755	1805	1873
Q Serve(g_s), s	2.3	15.5	15.7	17.4	17.0	17.0	14.0	13.1	13.4	11.7	16.8	16.8
Cycle Q Clear(g_c), s	2.3	15.5	15.7	17.4	17.0	17.0	14.0	13.1	13.4	11.7	16.8	16.8
Prop In Lane	1.00		0.28	1.00		0.36	1.00		0.34	1.00		0.08
Lane Grp Cap(c), veh/h	55	879	455	359	1459	753	496	443	437	494	442	458
V/C Ratio(X)	0.78	0.68	0.69	0.91	0.54	0.54	1.11	0.61	0.62	0.86	0.75	0.75
Avail Cap(c_a), veh/h	201	1466	759	457	1955	1009	496	747	737	567	783	813
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.7	33.3	33.4	38.8	21.5	21.5	42.5	33.2	33.4	41.6	34.6	34.6
Incr Delay (d2), s/veh	8.5	0.4	0.7	16.4	0.1	0.2	75.7	0.5	0.5	10.3	1.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.2	6.5	9.0	6.3	6.6	11.0	5.5	5.6	5.5	7.1	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.2	33.7	34.1	55.2	21.6	21.7	118.2	33.7	34.0	51.9	35.6	35.6
LnGrp LOS	E	C	C	E	C	C	F	C	C	D	D	D
Approach Vol, veh/h		957			1525			1092			1098	
Approach Delay, s/veh		34.8			28.8			76.5			41.9	
Approach LOS		C			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.9	28.3	23.6	29.2	18.0	28.2	7.0	45.8				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7				
Max Q Clear Time (g_c+I1), s	13.7	15.4	19.4	17.7	16.0	18.8	4.3	19.0				
Green Ext Time (p_c), s	0.2	1.8	0.2	3.6	0.0	2.2	0.0	5.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			44.3									
HCM 6th LOS			D									

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 		 	 	
Traffic Volume (veh/h)	321	951	120	110	1220	310	300	495	260	480	223	322
Future Volume (veh/h)	321	951	120	110	1220	310	300	495	260	480	223	322
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	349	1034	65	120	1326	132	326	538	168	522	242	226
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	289	1971	124	146	1640	502	228	692	215	443	923	404
Arrive On Green	0.16	0.40	0.40	0.08	0.32	0.32	0.13	0.26	0.25	0.13	0.26	0.26
Sat Flow, veh/h	1795	4949	311	1795	5147	1574	1795	2685	835	3483	3582	1566
Grp Volume(v), veh/h	349	716	383	120	1326	132	326	358	348	522	242	226
Grp Sat Flow(s),veh/h/ln	1795	1716	1828	1795	1716	1574	1795	1791	1729	1742	1791	1566
Q Serve(g_s), s	19.0	18.8	18.8	7.8	27.9	7.4	15.0	21.9	22.1	15.0	6.3	14.8
Cycle Q Clear(g_c), s	19.0	18.8	18.8	7.8	27.9	7.4	15.0	21.9	22.1	15.0	6.3	14.8
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	289	1366	728	146	1640	502	228	462	446	443	923	404
V/C Ratio(X)	1.21	0.52	0.53	0.82	0.81	0.26	1.43	0.78	0.78	1.18	0.26	0.56
Avail Cap(c_a), veh/h	289	1628	867	198	2180	667	228	683	659	443	1365	597
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	27.0	27.0	53.4	36.9	29.9	51.5	40.6	41.0	51.5	34.9	38.0
Incr Delay (d2), s/veh	121.4	0.1	0.2	13.4	1.3	0.1	216.5	1.7	1.9	101.9	0.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.0	7.3	7.9	4.0	11.4	2.7	20.3	9.5	9.3	12.6	2.7	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	170.9	27.1	27.2	66.8	38.2	30.0	268.0	42.3	42.9	153.5	34.9	38.5
LnGrp LOS	F	C	C	E	D	C	F	D	D	F	C	D
Approach Vol, veh/h		1448			1578			1032			990	
Approach Delay, s/veh		61.8			39.7			113.8			98.2	
Approach LOS		E			D			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.0	34.4	13.6	51.0	19.0	34.4	23.0	41.6				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	15.0	43.7	13.0	54.7	15.0	43.7	19.0	48.7				
Max Q Clear Time (g_c+I1), s	17.0	24.1	9.8	20.8	17.0	16.8	21.0	29.9				
Green Ext Time (p_c), s	0.0	2.4	0.0	4.7	0.0	1.2	0.0	6.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				72.7								
HCM 6th LOS				E								

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1807	850	290	1502	0	0	0	0	790	10	920
Future Volume (veh/h)	0	1807	850	290	1502	0	0	0	0	790	10	920
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1902	574	305	1581	0				840	0	931
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2328	710	335	3364	0				1046	0	465
Arrive On Green	0.00	0.45	0.45	0.17	0.65	0.00				0.29	0.00	0.29
Sat Flow, veh/h	0	5358	1581	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	1902	574	305	1581	0				840	0	931
Grp Sat Flow(s),veh/h/ln	0	1729	1581	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	40.9	40.2	19.3	19.7	0.0				27.5	0.0	37.0
Cycle Q Clear(g_c), s	0.0	40.9	40.2	19.3	19.7	0.0				27.5	0.0	37.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2328	710	335	3364	0				1046	0	465
V/C Ratio(X)	0.00	0.82	0.81	0.91	0.47	0.00				0.80	0.00	2.00
Avail Cap(c_a), veh/h	0	2998	914	420	4254	0				1046	0	465
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	30.7	30.5	52.3	11.4	0.0				42.1	0.0	45.5
Incr Delay (d2), s/veh	0.0	1.1	3.3	18.5	0.0	0.0				4.3	0.0	457.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	16.3	15.1	5.5	6.8	0.0				12.5	0.0	73.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	31.8	33.8	70.8	11.4	0.0				46.4	0.0	503.4
LnGrp LOS	A	C	C	E	B	A				D	A	F
Approach Vol, veh/h		2476			1886						1771	
Approach Delay, s/veh		32.3			21.0						286.6	
Approach LOS		C			C						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	25.6	61.5		41.0		87.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	27.0	72.7		35.7		103.7						
Max Q Clear Time (g_c+Q1), s	21.3	42.9		39.0		21.7						
Green Ext Time (p_c), s	0.3	13.3		0.0		9.3						

### Intersection Summary

HCM 6th Ctrl Delay 102.3  
HCM 6th LOS F

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1927	670	170	1032	620	760	50	930	0	0	0
Future Volume (veh/h)	0	1927	670	170	1032	620	760	50	930	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	0	2028	517	179	1086	341	838	0	842			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	1	1	1	1	1	1	1	1			
Cap, veh/h	0	2059	629	165	2702	815	1466	0	652			
Arrive On Green	0.00	0.40	0.40	0.09	0.52	0.52	0.41	0.00	0.41			
Sat Flow, veh/h	0	5316	1571	1795	5147	1551	3591	0	1598			
Grp Volume(v), veh/h	0	2028	517	179	1086	341	838	0	842			
Grp Sat Flow(s),veh/h/ln	0	1716	1571	1795	1716	1551	1795	0	1598			
Q Serve(g_s), s	0.0	46.8	35.3	11.0	15.2	16.1	21.6	0.0	49.0			
Cycle Q Clear(g_c), s	0.0	46.8	35.3	11.0	15.2	16.1	21.6	0.0	49.0			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2059	629	165	2702	815	1466	0	652			
V/C Ratio(X)	0.00	0.99	0.82	1.09	0.40	0.42	0.57	0.00	1.29			
Avail Cap(c_a), veh/h	0	2059	629	165	2702	815	1466	0	652			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	35.6	32.2	54.5	17.2	17.4	27.4	0.0	35.5			
Incr Delay (d2), s/veh	0.0	16.4	8.1	95.5	0.0	0.1	0.3	0.0	142.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	21.4	14.1	9.2	5.6	5.4	8.9	0.0	43.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	52.0	40.3	150.0	17.2	17.5	27.7	0.0	177.6			
LnGrp LOS	A	D	D	F	B	B	C	A	F			
Approach Vol, veh/h	2545			1606			1680					
Approach Delay, s/veh	49.6			32.1			102.8					
Approach LOS	D			C			F					
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.0	52.0		53.0		67.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	1.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+I1), s	1.0	48.8		51.0		18.1						
Green Ext Time (p_c), s	0.0	0.0		0.0		6.0						

## Intersection Summary

HCM 6th Ctrl Delay	60.1
HCM 6th LOS	E

## Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	170	10	10	70	370	10	160	20	415	310	80
Future Volume (veh/h)	80	170	10	10	70	370	10	160	20	415	310	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	87	185	11	11	76	292	11	174	2	451	337	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	144	493	29	117	90	347	117	411	5	502	1017	158
Arrive On Green	0.08	0.28	0.28	0.07	0.27	0.27	0.07	0.11	0.09	0.28	0.33	0.31
Sat Flow, veh/h	1795	1761	105	1795	341	1309	1795	3627	42	1795	3104	483
Grp Volume(v), veh/h	87	0	196	11	0	368	11	86	90	451	193	197
Grp Sat Flow(s),veh/h/ln	1795	0	1866	1795	0	1650	1795	1791	1878	1795	1791	1796
Q Serve(g_s), s	2.9	0.0	5.2	0.4	0.0	12.9	0.4	2.7	2.7	14.8	5.0	5.1
Cycle Q Clear(g_c), s	2.9	0.0	5.2	0.4	0.0	12.9	0.4	2.7	2.7	14.8	5.0	5.1
Prop In Lane	1.00		0.06	1.00		0.79	1.00		0.02	1.00		0.27
Lane Grp Cap(c), veh/h	144	0	523	117	0	438	117	203	213	502	587	589
V/C Ratio(X)	0.60	0.00	0.38	0.09	0.00	0.84	0.09	0.42	0.42	0.90	0.33	0.33
Avail Cap(c_a), veh/h	323	0	1098	323	0	971	616	1493	1566	616	1493	1498
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.2	0.0	17.7	26.9	0.0	21.3	26.9	25.3	25.3	21.2	15.5	15.7
Incr Delay (d2), s/veh	1.5	0.0	0.2	0.1	0.0	1.7	0.1	0.5	0.5	12.6	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.9	0.1	0.0	4.4	0.1	1.1	1.1	7.0	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.7	0.0	17.9	27.0	0.0	23.0	27.0	25.8	25.8	33.8	15.6	15.8
LnGrp LOS	C	A	B	C	A	C	C	C	C	C	B	B
Approach Vol, veh/h	283				379		187				841	
Approach Delay, s/veh	21.2				23.1		25.8				25.4	
Approach LOS	C				C		C				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.1	10.9	8.0	21.1	8.0	24.0	8.9	20.2				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+I1), s	4.7	4.7	2.4	7.2	2.4	7.1	4.9	14.9				
Green Ext Time (p_c), s	0.3	0.5	0.0	0.6	0.0	1.3	0.0	1.3				

## Intersection Summary

HCM 6th Ctrl Delay	24.2
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	210	222	280	210	160	154	845	181	150	1204	140
Future Volume (veh/h)	140	210	222	280	210	160	154	845	181	150	1204	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	152	228	223	304	228	142	167	918	171	163	1309	134
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	182	248	242	172	302	188	199	1106	206	194	1197	122
Arrive On Green	0.10	0.28	0.28	0.10	0.28	0.28	0.11	0.36	0.35	0.11	0.36	0.35
Sat Flow, veh/h	1810	882	863	1810	1095	682	1810	3038	566	1810	3307	337
Grp Volume(v), veh/h	152	0	451	304	0	370	167	545	544	163	712	731
Grp Sat Flow(s),veh/h/ln	1810	0	1745	1810	0	1777	1810	1805	1798	1810	1805	1839
Q Serve(g_s), s	8.7	0.0	26.3	10.0	0.0	20.0	9.5	28.9	29.0	9.3	38.0	38.0
Cycle Q Clear(g_c), s	8.7	0.0	26.3	10.0	0.0	20.0	9.5	28.9	29.0	9.3	38.0	38.0
Prop In Lane	1.00		0.49	1.00		0.38	1.00		0.31	1.00		0.18
Lane Grp Cap(c), veh/h	182	0	490	172	0	490	199	657	655	194	653	665
V/C Ratio(X)	0.84	0.00	0.92	1.76	0.00	0.76	0.84	0.83	0.83	0.84	1.09	1.10
Avail Cap(c_a), veh/h	190	0	615	172	0	609	327	687	685	293	653	665
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	0.0	36.6	47.5	0.0	34.8	45.8	30.4	30.6	46.0	33.5	33.6
Incr Delay (d2), s/veh	24.3	0.0	15.2	366.6	0.0	3.1	4.4	7.5	7.6	8.0	62.3	64.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	0.0	12.7	21.9	0.0	8.6	4.4	13.1	13.1	4.5	26.7	27.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.7	0.0	51.9	414.2	0.0	37.9	50.3	37.9	38.2	54.0	95.8	98.5
LnGrp LOS	E	A	D	F	A	D	D	D	D	D	F	F
Approach Vol, veh/h	603		674			1256			1606			
Approach Delay, s/veh	56.6		207.6			39.7			92.8			
Approach LOS	E		F			D			F			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	42.3	14.0	33.5	15.5	42.0	14.5	32.9					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	38.7	10.0	37.0	19.0	36.7	11.0	36.0					
Max Q Clear Time (g_c+I1), s	31.0	12.0	28.3	11.5	40.0	10.7	22.0					
Green Ext Time (p_c), s	0.1	2.7	0.0	1.2	0.1	0.0	0.0	1.1				
Intersection Summary												
HCM 6th Ctrl Delay	90.1											
HCM 6th LOS	F											












# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	0	6	50	0	170	2	1115	70	360	1106	51
Future Volume (veh/h)	98	0	6	50	0	170	2	1115	70	360	1106	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	0	1900	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	107	0	7	54	0	-117	2	1212	50	391	1202	55
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	0	0	2	0	0	0	0	0
Cap, veh/h	290	0	143	0	0	0	325	1601	698	454	2694	123
Arrive On Green	0.09	0.00	0.08	0.00	0.00	0.00	0.44	0.44	0.44	0.25	0.77	0.74
Sat Flow, veh/h	1781	0	1585		0		442	3610	1575	1810	3515	161
Grp Volume(v), veh/h	107	0	7		0.0		2	1212	50	391	617	640
Grp Sat Flow(s),veh/h/ln	1781	0	1585				442	1805	1575	1810	1805	1871
Q Serve(g_s), s	3.2	0.0	0.2				0.1	15.7	1.0	11.5	6.8	6.8
Cycle Q Clear(g_c), s	3.2	0.0	0.2				0.1	15.7	1.0	11.5	6.8	6.8
Prop In Lane	1.00		1.00				1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	290	0	143				325	1601	698	454	1383	1434
V/C Ratio(X)	0.37	0.00	0.05				0.01	0.76	0.07	0.86	0.45	0.45
Avail Cap(c_a), veh/h	722	0	527				455	2660	1160	1073	2530	2623
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.5	0.0	23.4				8.7	13.0	8.9	19.9	2.3	2.3
Incr Delay (d2), s/veh	0.8	0.0	0.1				0.0	0.3	0.0	1.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.1				0.0	4.6	0.3	4.2	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	0.0	23.5				8.7	13.3	8.9	21.8	2.4	2.4
LnGrp LOS	C	A	C				A	B	A	C	A	A
Approach Vol, veh/h	114						1264			1648		
Approach Delay, s/veh	25.2						13.1			7.0		
Approach LOS	C						B			A		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	8.0	28.7	9.0		46.6							
Change Period (Y+Rc), s	4.0	5.3	4.5		5.3							
Max Green Setting (Gmax), s	33.0	39.7	18.0		76.7							
Max Q Clear Time (g_c+I1), s	13.5	17.7	5.2		8.8							
Green Ext Time (p_c), s	0.5	5.7	0.2		5.5							

### Intersection Summary

HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B



# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	80	19	90	94	451	11	461	70	570	696	35
Future Volume (veh/h)	54	80	19	90	94	451	11	461	70	570	696	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	57	84	20	95	99	158	12	485	67	600	733	37
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	292	341	289	374	324	289	23	855	118	836	1727	87
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.01	0.27	0.23	0.24	0.49	0.46
Sat Flow, veh/h	1140	1900	1610	1311	1805	1610	1810	3188	438	3510	3497	176
Grp Volume(v), veh/h	57	84	20	95	99	158	12	274	278	600	378	392
Grp Sat Flow(s), veh/h/ln	1140	1900	1610	1311	1805	1610	1810	1805	1821	1755	1805	1868
Q Serve(g_s), s	1.8	1.5	0.4	2.6	1.8	3.4	0.3	5.0	5.1	6.0	5.1	5.2
Cycle Q Clear(g_c), s	5.2	1.5	0.4	4.0	1.8	3.4	0.3	5.0	5.1	6.0	5.1	5.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.24	1.00		0.09
Lane Grp Cap(c), veh/h	292	341	289	374	324	289	23	484	488	836	891	923
V/C Ratio(X)	0.20	0.25	0.07	0.25	0.31	0.55	0.53	0.57	0.57	0.72	0.42	0.42
Avail Cap(c_a), veh/h	2235	3579	3033	2608	3400	3033	568	1984	2001	2204	2550	2640
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.6	13.5	13.0	15.2	13.6	14.3	18.8	12.1	12.2	13.4	6.2	6.2
Incr Delay (d2), s/veh	0.1	0.1	0.0	0.1	0.2	0.6	7.0	0.4	0.4	0.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.5	0.1	0.6	0.6	0.9	0.1	1.4	1.4	1.9	1.2	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.8	13.6	13.1	15.3	13.8	14.9	25.7	12.5	12.6	13.8	6.3	6.4
LnGrp LOS	B	B	B	B	B	B	C	B	B	B	A	A
Approach Vol, veh/h	161			352			564			1370		
Approach Delay, s/veh	14.6			14.7			12.8			9.6		
Approach LOS	B			B			B			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.2			10.9	4.5	22.9		10.9				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	40.7			72.0	12.0	52.7		72.0				
Max Q Clear Time (g_c+1/3g), s	7.1			7.2	2.3	7.2		6.0				
Green Ext Time (p_c), s	1.1	1.9		0.4	0.0	3.4		1.0				

### Intersection Summary









HCM 6th Ctrl Delay	11.4
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	613	30	90	889	130	150	210	270	120	50	153
Future Volume (veh/h)	114	613	30	90	889	130	150	210	270	120	50	153
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	645	16	95	936	95	158	221	151	126	53	67
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	159	1212	30	130	1062	108	107	731	478	125	648	578
Arrive On Green	0.09	0.34	0.34	0.07	0.33	0.32	0.06	0.35	0.35	0.07	0.36	0.36
Sat Flow, veh/h	1781	3544	88	1781	3257	331	1781	2058	1346	1781	1777	1585
Grp Volume(v), veh/h	120	323	338	95	511	520	158	189	183	126	53	67
Grp Sat Flow(s),veh/h/ln	1781	1777	1855	1781	1777	1811	1781	1777	1628	1781	1777	1585
Q Serve(g_s), s	6.6	14.6	14.7	5.2	27.2	27.2	6.0	7.7	8.2	7.0	2.0	2.8
Cycle Q Clear(g_c), s	6.6	14.6	14.7	5.2	27.2	27.2	6.0	7.7	8.2	7.0	2.0	2.8
Prop In Lane	1.00		0.05	1.00		0.18	1.00		0.83	1.00		1.00
Lane Grp Cap(c), veh/h	159	608	634	130	579	591	107	631	578	125	648	578
V/C Ratio(X)	0.76	0.53	0.53	0.73	0.88	0.88	1.48	0.30	0.32	1.01	0.08	0.12
Avail Cap(c_a), veh/h	280	613	640	303	631	643	107	631	578	125	648	578
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	26.5	26.5	45.4	31.9	31.9	47.0	23.3	23.6	46.5	20.8	21.2
Incr Delay (d2), s/veh	7.2	0.9	0.8	7.6	13.0	12.8	258.7	1.2	1.4	83.5	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	6.0	6.2	2.5	13.0	13.2	10.2	3.3	3.2	5.9	0.8	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	27.3	27.3	52.9	44.9	44.7	305.7	24.5	25.0	130.0	21.0	21.6
LnGrp LOS	D	C	C	D	D	D	F	C	C	F	C	C
Approach Vol, veh/h	781			1126			530			246		
Approach Delay, s/veh	31.1			45.5			108.5			77.0		
Approach LOS	C			D			F			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	1.0	39.5	11.3	38.2	10.0	40.5	12.9	36.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.5	35.0	16.5	34.0	5.5	36.0	15.2	35.0				
Max Q Clear Time (g_c+19, s)	19.5	10.2	7.2	16.7	8.0	4.8	8.6	29.2				
Green Ext Time (p_c), s	0.0	2.0	0.1	3.4	0.0	0.6	0.1	2.9				

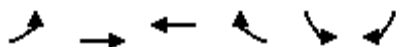
### Intersection Summary

HCM 6th Ctrl Delay	56.6
HCM 6th LOS	E

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

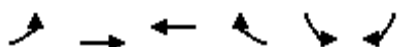
The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	73	930	1055	880	310	54
Future Volume (veh/h)	73	930	1055	880	310	54
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	77	979	1111	469	326	26
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	112	2064	1637	730	1056	484
Arrive On Green	0.06	0.58	0.46	0.46	0.31	0.31
Sat Flow, veh/h	1781	3647	3647	1585	3456	1585
Grp Volume(v), veh/h	77	979	1111	469	326	26
Grp Sat Flow(s), veh/h/ln	1781	1777	1777	1585	1728	1585
Q Serve(g_s), s	3.0	11.2	17.3	15.9	5.1	0.8
Cycle Q Clear(g_c), s	3.0	11.2	17.3	15.9	5.1	0.8
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	112	2064	1637	730	1056	484
V/C Ratio(X)	0.69	0.47	0.68	0.64	0.31	0.05
Avail Cap(c_a), veh/h	342	4572	3688	1645	1056	484
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.3	8.5	14.9	14.5	18.7	17.2
Incr Delay (d2), s/veh	7.2	0.2	0.5	0.9	0.8	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.4	3.2	5.7	4.8	1.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	39.5	8.7	15.4	15.5	19.5	17.5
LnGrp LOS	D	A	B	B	B	B
Approach Vol, veh/h		1056	1580		352	
Approach Delay, s/veh		11.0	15.4		19.3	
Approach LOS		B	B		B	
Timer - Assigned Phs			4		6	7 8
Phs Duration (G+Y+Rc), s			44.8		25.5	8.4 36.4
Change Period (Y+Rc), s			4.5		4.5	4.5 4.5
Max Green Setting (Gmax), s			90.0		21.0	13.0 72.5
Max Q Clear Time (g_c+I1), s			13.2		7.1	5.0 19.3
Green Ext Time (p_c), s			7.9		1.0	0.1 12.7
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			14.3			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	349	1031	1831	570	960	184
Future Volume (veh/h)	349	1031	1831	570	960	184
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	379	1121	1990	428	1043	-14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	409	3218	1320	589	1131	519
Arrive On Green	0.23	0.62	0.37	0.37	0.32	0.00
Sat Flow, veh/h	1810	5358	3705	1610	3510	1610
Grp Volume(v), veh/h	379	1121	1990	428	1043	-14
Grp Sat Flow(s), veh/h/ln	1810	1729	1805	1610	1755	1610
Q Serve(g_s), s	28.6	14.6	51.0	32.0	40.0	0.0
Cycle Q Clear(g_c), s	28.6	14.6	51.0	32.0	40.0	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	409	3218	1320	589	1131	519
V/C Ratio(X)	0.93	0.35	1.51	0.73	0.92	-0.03
Avail Cap(c_a), veh/h	454	3346	1320	589	1309	600
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.8	12.8	44.2	38.2	45.6	0.0
Incr Delay (d2), s/veh	23.8	0.0	232.5	3.9	9.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	5.3	64.5	12.9	18.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	76.6	12.8	276.7	42.2	54.9	0.0
LnGrp LOS	E	B	F	D	D	A
Approach Vol, veh/h		1500	2418		1029	
Approach Delay, s/veh		29.0	235.2		55.7	
Approach LOS		C	F		E	
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		90.6			35.6	55.0
Change Period (Y+Rc), s		5.3			4.5	5.3
Max Green Setting (Gmax), s		88.7			34.5	49.7
Max Q Clear Time (g_c+I1), s		16.6			30.6	53.0
Green Ext Time (p_c), s		5.5			0.5	0.0
Intersection Summary						
HCM 6th Ctrl Delay			135.3			
HCM 6th LOS			F			

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↑			↑↑	↰	↰	↰	↰			
Traffic Volume (veh/h)	503	1488	0	0	1839	1170	562	10	220	0	0	0
Future Volume (veh/h)	503	1488	0	0	1839	1170	562	10	220	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	529	1566	0	0	1936	837	600	0	197			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	599	3805	0	0	2011	852	720	0	320			
Arrive On Green	0.17	0.73	0.00	0.00	0.53	0.53	0.20	0.00	0.20			
Sat Flow, veh/h	3510	5358	0	0	3800	1610	3619	0	1610			
Grp Volume(v), veh/h	529	1566	0	0	1936	837	600	0	197			
Grp Sat Flow(s),veh/h/ln	1755	1729	0	0	1900	1610	1810	0	1610			
Q Serve(g_s), s	17.4	13.7	0.0	0.0	57.9	60.4	18.9	0.0	13.2			
Cycle Q Clear(g_c), s	17.4	13.7	0.0	0.0	57.9	60.4	18.9	0.0	13.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	599	3805	0	0	2011	852	720	0	320			
V/C Ratio(X)	0.88	0.41	0.00	0.00	0.96	0.98	0.83	0.00	0.61			
Avail Cap(c_a), veh/h	859	4190	0	0	2011	852	1414	0	629			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	48.0	6.0	0.0	0.0	26.8	27.3	45.6	0.0	43.3			
Incr Delay (d2), s/veh	6.0	0.0	0.0	0.0	12.4	26.3	1.0	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.9	3.9	0.0	0.0	27.0	27.0	8.3	0.0	11.7			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	6.1	0.0	0.0	39.2	53.7	46.6	0.0	44.0			
LnGrp LOS	D	A	A	A	D	D	D	A	D			
Approach Vol, veh/h	2095			2773			797					
Approach Delay, s/veh	18.2			43.5			45.9					
Approach LOS	B			D			D					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	90.9			27.6		24.2	66.7					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	94.4			45.0		29.0	61.4					
Max Q Clear Time (g_c+I1), s	15.7			20.9		19.4	62.4					
Green Ext Time (p_c), s	9.2			1.4		0.8	0.0					

### Intersection Summary




HCM 6th Ctrl Delay	34.5
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

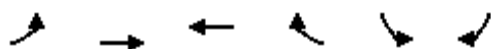
The Ranch  
Cumulative Plus Phase 1 PM Peak Hour

Intersection						
Int Delay, s/veh	179.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	120	529	53	50	489	125
Future Vol, veh/h	120	529	53	50	489	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	130	575	58	54	532	136
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1285	85	0	0	112	0
Stage 1	85	-	-	-	-	-
Stage 2	1200	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	183	980	-	-	1490	-
Stage 1	943	-	-	-	-	-
Stage 2	288	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 112	980	-	-	1490	-
Mov Cap-2 Maneuver	~ 112	-	-	-	-	-
Stage 1	943	-	-	-	-	-
Stage 2	177	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s\$	371.3	0		7		
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	403	1490	-	
HCM Lane V/C Ratio	-	-	1.75	0.357	-	
HCM Control Delay (s)	-	-\$	371.3	8.8	0	
HCM Lane LOS	-	-	F	A	A	
HCM 95th %tile Q(veh)	-	-	43.8	1.6	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

# HCM 6th Signalized Intersection Summary

## 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



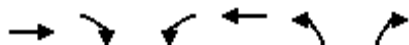
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↱↱	↰	↰	↰↰	
Traffic Volume (veh/h)	340	1475	945	100	480	910	
Future Volume (veh/h)	340	1475	945	100	480	910	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	370	1603	1027	0	522	985	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	361	1694	1200		808	1557	
Arrive On Green	0.10	0.48	0.34	0.00	0.45	0.45	
Sat Flow, veh/h	3456	3647	3647	1585	1781	2790	
Grp Volume(v), veh/h	370	1603	1027	0	522	985	
Grp Sat Flow(s),veh/h/ln	1728	1777	1777	1585	1781	1395	
Q Serve(g_s), s	12.0	49.5	31.0	0.0	26.0	27.7	
Cycle Q Clear(g_c), s	12.0	49.5	31.0	0.0	26.0	27.7	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	361	1694	1200		808	1557	
V/C Ratio(X)	1.03	0.95	0.86		0.65	0.63	
Avail Cap(c_a), veh/h	361	1740	1245		808	1557	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	51.5	28.7	35.5	0.0	24.3	17.4	
Incr Delay (d2), s/veh	54.2	11.0	5.6	0.0	1.4	0.6	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	7.8	21.8	13.6	0.0	11.1	22.8	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	105.7	39.7	41.1	0.0	25.7	18.0	
LnGrp LOS	F	D	D		C	B	
Approach Vol, veh/h							
		1973	1027	A	1507		
Approach Delay, s/veh							
		52.1	41.1		20.7		
Approach LOS							
		D	D		C		
Timer - Assigned Phs							
				4	6	7	8
Phs Duration (G+Y+Rc), s				58.8	56.2	16.0	42.8
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				55.8	50.2	11.5	39.8
Max Q Clear Time (g_c+I1), s				51.5	29.7	14.0	33.0
Green Ext Time (p_c), s				2.9	3.5	0.0	2.6
Intersection Summary							
HCM 6th Ctrl Delay			39.1				
HCM 6th LOS			D				

### Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	1235	727	0	1663	152	30
Future Volume (veh/h)	1235	727	0	1663	152	30
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1342	599	0	1808	165	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	2115	943	0	2115	1158	531
Arrive On Green	0.60	0.60	0.00	0.60	0.34	0.34
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1342	599	0	1808	165	5
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	28.2	28.3	0.0	48.2	3.8	0.2
Cycle Q Clear(g_c), s	28.2	28.3	0.0	48.2	3.8	0.2
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2115	943	0	2115	1158	531
V/C Ratio(X)	0.63	0.63	0.00	0.85	0.14	0.01
Avail Cap(c_a), veh/h	2565	1144	0	2565	1158	531
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.1	15.1	0.0	19.2	26.7	25.5
Incr Delay (d2), s/veh	0.4	0.8	0.0	2.6	0.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.9	9.9	0.0	18.0	1.6	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	15.5	16.0	0.0	21.8	26.9	25.5
LnGrp LOS	B	B	A	C	C	C
Approach Vol, veh/h	1941			1808	170	
Approach Delay, s/veh	15.7			21.8	26.9	
Approach LOS	B			C	C	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	42.6			72.4		72.4
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	23.5			82.5		82.5
Max Q Clear Time (g_c+I1), s	5.8			30.3		50.2
Green Ext Time (p_c), s	0.5			20.8		17.7
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			19.0			
HCM 6th LOS			B			














# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Cumulative Plus Phase 1 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	271	60	60	20	50	20	30	454	20	20	303	160
Future Volume (veh/h)	271	60	60	20	50	20	30	454	20	20	303	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	288	64	64	21	53	21	32	483	21	21	322	170
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	263	453	384	71	171	68	91	884	394	71	843	376
Arrive On Green	0.15	0.24	0.24	0.04	0.13	0.12	0.05	0.25	0.25	0.04	0.24	0.24
Sat Flow, veh/h	1781	1870	1585	1781	1274	505	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	288	64	64	21	0	74	32	483	21	21	322	170
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1779	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.5	1.0	1.2	0.4	0.0	1.4	0.6	4.4	0.4	0.4	2.8	3.4
Cycle Q Clear(g_c), s	5.5	1.0	1.2	0.4	0.0	1.4	0.6	4.4	0.4	0.4	2.8	3.4
Prop In Lane	1.00		1.00	1.00		0.28	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	453	384	71	0	239	91	884	394	71	843	376
V/C Ratio(X)	1.09	0.14	0.17	0.30	0.00	0.31	0.35	0.55	0.05	0.30	0.38	0.45
Avail Cap(c_a), veh/h	263	929	787	263	0	884	263	1861	830	263	1861	830
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	11.1	11.1	17.4	0.0	14.6	17.1	12.2	10.7	17.4	11.9	12.1
Incr Delay (d2), s/veh	83.2	0.1	0.2	2.3	0.0	0.7	2.3	0.5	0.1	2.3	0.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	0.3	0.4	0.2	0.0	0.5	0.3	1.2	0.1	0.2	0.8	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.0	11.2	11.3	19.7	0.0	15.4	19.3	12.7	10.7	19.7	12.2	13.0
LnGrp LOS	F	B	B	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	416				95		536				513	
Approach Delay, s/veh	72.0				16.3		13.0				12.8	
Approach LOS	E				B		B				B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.5	13.3	5.5	13.0	5.9	12.8	9.5	9.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+12.5), s	12.4	6.4	2.4	3.2	2.6	5.4	7.5	3.4				
Green Ext Time (p_c), s	0.0	2.4	0.0	0.4	0.0	2.0	0.0	0.2				



















### Intersection Summary

HCM 6th Ctrl Delay	28.9
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour







												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	370	10	450	1128	948	0	0	798	530
Future Volume (veh/h)	0	0	0	370	10	450	1128	948	0	0	798	530
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	1885	1885	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				402	11	390	1226	1030	0	0	867	230
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				1	1	1	2	2	0	0	2	2
Cap, veh/h				976	0	448	1322	2265	0	0	1374	337
Arrive On Green				0.28	0.27	0.28	0.38	0.64	0.00	0.00	0.21	0.21
Sat Flow, veh/h				3483	0	1598	3456	3647	0	0	6696	1576
Grp Volume(v), veh/h				402	0	390	1226	1030	0	0	867	230
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1728	1777	0	0	1609	1576
Q Serve(g_s), s				9.1	0.0	22.6	33.0	14.4	0.0	0.0	11.9	13.0
Cycle Q Clear(g_c), s				9.1	0.0	22.6	33.0	14.4	0.0	0.0	11.9	13.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				976	0	448	1322	2265	0	0	1374	337
V/C Ratio(X)				0.41	0.00	0.87	0.93	0.45	0.00	0.00	0.63	0.68
Avail Cap(c_a), veh/h				1543	0	708	1602	3257	0	0	2651	649
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				28.4	0.0	33.3	28.7	9.0	0.0	0.0	34.7	35.2
Incr Delay (d2), s/veh				0.1	0.0	4.4	8.0	0.1	0.0	0.0	0.2	0.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.6	0.0	8.7	13.9	4.5	0.0	0.0	4.4	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				28.5	0.0	37.7	36.6	9.0	0.0	0.0	34.9	36.1
LnGrp LOS				C	A	D	D	A	A	A	C	D
Approach Vol, veh/h					792			2256			1097	
Approach Delay, s/veh					33.0			24.0			35.1	
Approach LOS					C			C			D	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	65.9			41.1			24.7			31.2		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	16.4			35.0			15.0			24.6		
Green Ext Time (p_c), s	4.9			2.2			4.1			1.3		
Intersection Summary												
HCM 6th Ctrl Delay	28.7											
HCM 6th LOS	C											

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	460	10	793	0	0	0	0	1616	240	310	858	0
Future Volume (veh/h)	460	10	793	0	0	0	0	1616	240	310	858	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1885	1885	1870	1870	0
Adj Flow Rate, veh/h	500	0	869				0	1757	239	337	933	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	1	1	2	2	0
Cap, veh/h	1236	0	1100				0	2284	311	420	1937	0
Arrive On Green	0.35	0.00	0.35				0.00	0.39	0.38	0.12	0.55	0.00
Sat Flow, veh/h	3534	0	3145				0	6078	791	3456	3647	0
Grp Volume(v), veh/h	500	0	869				0	1470	526	337	933	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1621	1741	1728	1777	0
Q Serve(g_s), s	9.5	0.0	22.0				0.0	23.3	23.3	8.4	14.3	0.0
Cycle Q Clear(g_c), s	9.5	0.0	22.0				0.0	23.3	23.3	8.4	14.3	0.0
Prop In Lane	1.00		1.00				0.00		0.45	1.00		0.00
Lane Grp Cap(c), veh/h	1236	0	1100				0	1911	684	420	1937	0
V/C Ratio(X)	0.40	0.00	0.79				0.00	0.77	0.77	0.80	0.48	0.00
Avail Cap(c_a), veh/h	2757	0	2453				0	2309	827	664	2531	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.8	0.0	25.8				0.0	23.4	23.6	37.8	12.4	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.3				0.0	1.0	2.8	1.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	7.7				0.0	8.2	9.2	3.5	4.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.0	0.0	27.1				0.0	24.4	26.5	39.4	12.5	0.0
LnGrp LOS	C	A	C				A	C	C	D	B	A
Approach Vol, veh/h	1369						1996			1270		
Approach Delay, s/veh	25.3						24.9			19.6		
Approach LOS	C						C			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	4.8	38.8	34.9		53.5							
Change Period (Y+Rc), s	4.0	5.3	4.5		* 5.3							
Max Green Setting (Gmax), s	7.0	40.7	68.5		* 63							
Max Q Clear Time (g_c+I10), s	4.0	25.3	24.0		16.3							
Green Ext Time (p_c), s	0.4	8.1	6.5		4.3							

### Intersection Summary

HCM 6th Ctrl Delay	23.6
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.
















\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour

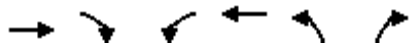


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	  		 	
Traffic Volume (veh/h)	30	20	90	533	100	190	340	670	1371	60	790	60
Future Volume (veh/h)	30	20	90	533	100	190	340	670	1371	60	790	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1781	1781	1781	1841	1841	1841	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	33	22	8	579	109	0	370	728	633	65	859	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	4	4	4	2	2	2	5	5	5
Cap, veh/h	46	98	36	719	364	0	410	1768	1367	97	1062	74
Arrive On Green	0.03	0.08	0.07	0.15	0.20	0.00	0.23	0.50	0.50	0.06	0.32	0.31
Sat Flow, veh/h	1697	1239	450	4944	1841	0	1781	3554	2747	1739	3289	230
Grp Volume(v), veh/h	33	0	30	579	109	0	370	728	633	65	453	466
Grp Sat Flow(s),veh/h/ln	1697	0	1689	1648	1841	0	1781	1777	1374	1739	1735	1784
Q Serve(g_s), s	1.4	0.0	1.2	8.2	3.6	0.0	14.5	9.3	10.8	2.6	17.2	17.2
Cycle Q Clear(g_c), s	1.4	0.0	1.2	8.2	3.6	0.0	14.5	9.3	10.8	2.6	17.2	17.2
Prop In Lane	1.00		0.27	1.00		0.00	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	46	0	134	719	364	0	410	1768	1367	97	560	576
V/C Ratio(X)	0.72	0.00	0.22	0.81	0.30	0.00	0.90	0.41	0.46	0.67	0.81	0.81
Avail Cap(c_a), veh/h	118	0	696	824	938	0	420	2383	1842	97	850	874
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.8	0.0	31.1	29.8	24.6	0.0	26.9	11.4	11.8	33.4	22.3	22.4
Incr Delay (d2), s/veh	7.9	0.0	0.3	4.5	0.2	0.0	21.4	0.1	0.1	14.0	1.9	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.5	3.3	1.5	0.0	8.0	3.0	2.7	1.4	6.4	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.6	0.0	31.5	34.3	24.8	0.0	48.4	11.5	11.9	47.3	24.2	24.2
LnGrp LOS	D	A	C	C	C	A	D	B	B	D	C	C
Approach Vol, veh/h	63		688			1731			984			
Approach Delay, s/veh	37.3		32.8			19.5			25.7			
Approach LOS	D		C			B			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	39.8	14.5	9.7	20.6	27.3	5.9	18.3				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	47.4	12.0	29.1	17.0	34.4	5.0	36.1				
Max Q Clear Time (g_c+14.6), s	4.0	12.8	10.2	3.2	16.5	19.2	3.4	5.6				
Green Ext Time (p_c), s	0.0	4.9	0.3	0.1	0.0	3.0	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			24.2									
HCM 6th LOS			C									

# HCM 6th Signalized Intersection Summary

## 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour








Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	490	961	260	360	463	350
Future Volume (veh/h)	490	961	260	360	463	350
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1366	1366	1856	1856
Adj Flow Rate, veh/h	533	673	283	391	503	380
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	36	36	3	3
Cap, veh/h	1656	733	363	902	820	376
Arrive On Green	0.47	0.47	0.14	0.66	0.24	0.24
Sat Flow, veh/h	3647	1573	2525	1366	3428	1572
Grp Volume(v), veh/h	533	673	283	391	503	380
Grp Sat Flow(s),veh/h/ln	1777	1573	1262	1366	1714	1572
Q Serve(g_s), s	7.5	31.7	8.6	10.8	10.4	19.0
Cycle Q Clear(g_c), s	7.5	31.7	8.6	10.8	10.4	19.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1656	733	363	902	820	376
V/C Ratio(X)	0.32	0.92	0.78	0.43	0.61	1.01
Avail Cap(c_a), veh/h	1968	871	477	1083	820	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.3	19.8	32.8	6.4	27.0	30.2
Incr Delay (d2), s/veh	0.0	12.0	6.0	0.1	1.0	49.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	12.1	2.7	2.2	4.2	11.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.4	31.8	38.8	6.5	28.0	79.4
LnGrp LOS	B	C	D	A	C	F
Approach Vol, veh/h	1206			674	883	
Approach Delay, s/veh	23.7			20.1	50.1	
Approach LOS	C			C	D	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		23.0	15.4	41.0		56.5
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		19.0	14.5	43.4		62.4
Max Q Clear Time (g_c+I1), s		21.0	10.6	33.7		12.8
Green Ext Time (p_c), s		0.0	0.4	2.7		1.4
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			31.2			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	20	1102	0	0	0	0	2111	419	200	783	0
Future Volume (veh/h)	270	20	1102	0	0	0	0	2111	419	200	783	0
Initial Q (Qb), veh	0	0	60				0	60	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1826	1826	0
Adj Flow Rate, veh/h	293	22	670				0	2295	433	217	851	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	5	5	0
Cap, veh/h	590	0	603				0	2881	404	280	3756	0
Arrive On Green	0.18	0.16	0.18				0.00	0.61	0.60	0.08	0.75	0.00
Sat Flow, veh/h	3456	0	3614				0	5027	799	3374	5149	0
Grp Volume(v), veh/h	293	0	670				0	1800	928	217	851	0
Grp Sat Flow(s),veh/h/ln	1728	0	1205				0	1122	1711	1687	1662	0
Q Serve(g_s), s	7.8	0.0	18.0				0.0	45.3	46.8	6.4	5.4	0.0
Cycle Q Clear(g_c), s	7.8	0.0	18.0				0.0	45.3	46.8	6.4	5.4	0.0
Prop In Lane	1.00		1.00				0.00		0.47	1.00		0.00
Lane Grp Cap(c), veh/h	590	0	603				0	2098	1075	280	3756	0
V/C Ratio(X)	0.50	0.00	1.11				0.00	0.86	0.86	0.77	0.23	0.00
Avail Cap(c_a), veh/h	610	0	638				0	2245	1140	397	3714	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.7	0.0	44.9				0.0	18.3	17.7	47.4	3.9	0.0
Incr Delay (d2), s/veh	0.2	0.0	70.7				0.0	3.2	6.3	3.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	358.0				0.0	23.4	10.2	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	29.1				0.0	17.4	22.4	2.8	1.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.9	0.0	473.6				0.0	44.9	34.2	51.0	3.9	0.0
LnGrp LOS	D	A	F				A	D	C	D	A	A
Approach Vol, veh/h	963						2728			1068		
Approach Delay, s/veh	341.6						41.2			13.4		
Approach LOS	F						D			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	3.4	66.6	22.0	80.0								
Change Period (Y+Rc), s	4.9	* 4.9	5.3	4.9								
Max Green Setting (Gmax), s	2.0	* 67	16.7	46.1								
Max Q Clear Time (g_c+I), s	13.4	48.8	20.0	7.4								
Green Ext Time (p_c), s	0.1	12.8	0.0	3.9								

### Intersection Summary

HCM 6th Ctrl Delay	95.8
HCM 6th LOS	F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	↰
Traffic Volume (veh/h)	40	30	30	220	40	260	40	1826	170	180	901	30
Future Volume (veh/h)	40	30	30	220	40	260	40	1826	170	180	901	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	33	0	239	43	28	43	1985	182	196	979	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	1	1	1	2	2	2	2	2	2
Cap, veh/h	74	57	115	279	293	248	55	1899	171	251	2167	71
Arrive On Green	0.07	0.07	0.00	0.16	0.16	0.16	0.03	0.58	0.57	0.07	0.62	0.61
Sat Flow, veh/h	1021	784	1572	1795	1885	1595	1781	3295	297	3456	3509	115
Grp Volume(v), veh/h	76	0	0	239	43	28	43	1056	1111	196	496	515
Grp Sat Flow(s), veh/h/ln	1804	0	1572	1795	1885	1595	1781	1777	1816	1728	1777	1847
Q Serve(g_s), s	5.3	0.0	0.0	16.9	2.6	2.0	3.1	75.0	75.0	7.3	19.3	19.3
Cycle Q Clear(g_c), s	5.3	0.0	0.0	16.9	2.6	2.0	3.1	75.0	75.0	7.3	19.3	19.3
Prop In Lane	0.57		1.00	1.00		1.00	1.00		0.16	1.00		0.06
Lane Grp Cap(c), veh/h	131	0	115	279	293	248	55	1024	1046	251	1098	1141
V/C Ratio(X)	0.58	0.00	0.00	0.86	0.15	0.11	0.78	1.03	1.06	0.78	0.45	0.45
Avail Cap(c_a), veh/h	485	0	423	524	550	466	219	1024	1046	425	1098	1141
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	0.0	0.0	53.5	47.5	47.3	62.6	27.6	27.6	59.3	13.2	13.2
Incr Delay (d2), s/veh	1.5	0.0	0.0	3.0	0.1	0.1	8.3	36.4	45.8	2.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	7.7	1.2	0.8	1.5	38.8	42.4	3.3	7.6	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.9	0.0	0.0	56.5	47.6	47.3	70.9	64.0	73.4	61.4	13.3	13.3
LnGrp LOS	E	A	A	E	D	D	E	F	F	E	B	B
Approach Vol, veh/h		76			310			2210			1207	
Approach Delay, s/veh		59.9			54.4			68.9			21.1	
Approach LOS		E			D			E			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.4	79.0		13.5	8.1	84.4		24.2				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+19.3), s	19.3	77.0		7.3	5.1	21.3		18.9				
Green Ext Time (p_c), s	0.2	0.0		0.2	0.0	4.9		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				52.3								
HCM 6th LOS				D								













# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	150	90	90	200	900	100	1029	30	540	975	150
Future Volume (veh/h)	160	150	90	90	200	900	100	1029	30	540	975	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	174	163	35	98	217	978	109	1118	32	587	1060	84
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	2	2	2
Cap, veh/h	197	937	196	119	523	1463	280	1140	33	638	1212	701
Arrive On Green	0.11	0.32	0.32	0.07	0.28	0.27	0.16	0.32	0.31	0.18	0.34	0.33
Sat Flow, veh/h	1781	2915	610	1795	1885	3195	1795	3555	102	3456	3554	1582
Grp Volume(v), veh/h	174	98	100	98	217	978	109	563	587	587	1060	84
Grp Sat Flow(s),veh/h/ln	1781	1777	1748	1795	1885	1598	1795	1791	1865	1728	1777	1582
Q Serve(g_s), s	14.4	5.9	6.2	8.1	14.1	35.8	8.2	46.6	46.7	25.0	41.9	2.6
Cycle Q Clear(g_c), s	14.4	5.9	6.2	8.1	14.1	35.8	8.2	46.6	46.7	25.0	41.9	2.6
Prop In Lane	1.00		0.35	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	197	571	562	119	523	1463	280	574	598	638	1212	701
V/C Ratio(X)	0.89	0.17	0.18	0.83	0.42	0.67	0.39	0.98	0.98	0.92	0.87	0.12
Avail Cap(c_a), veh/h	274	879	864	120	768	1880	280	574	598	739	1639	891
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.6	36.5	36.6	69.0	44.2	31.7	56.8	50.4	50.4	59.9	46.3	10.2
Incr Delay (d2), s/veh	17.4	0.1	0.1	33.3	0.2	0.3	0.3	32.4	31.7	14.4	3.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	2.6	2.6	4.8	6.5	13.4	3.7	25.4	26.4	12.2	19.1	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.0	36.5	36.7	102.4	44.4	32.0	57.1	82.7	82.1	74.3	49.7	10.2
LnGrp LOS	F	D	D	F	D	C	E	F	F	E	D	B
Approach Vol, veh/h	372		1293				1259			1731		
Approach Delay, s/veh	58.3		39.4				80.2			56.1		
Approach LOS	E		D				F			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	31.6	52.0	13.9	52.1	28.6	55.0	20.5	45.5				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	32.0	46.7	10.0	73.4	11.0	* 68	23.0	60.4				
Max Q Clear Time (g_c+T), s	27.0	48.7	10.1	8.2	10.2	43.9	16.4	37.8				
Green Ext Time (p_c), s	0.7	0.0	0.0	0.6	0.0	5.8	0.1	3.1				

### Intersection Summary

HCM 6th Ctrl Delay 58.2

HCM 6th LOS E

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.














# HCM 6th Signalized Intersection Summary

The Ranch

## 8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	720	310	908	10	150	90	848	1436	20	80	921	170
Future Volume (veh/h)	720	310	908	10	150	90	848	1436	20	80	921	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	560	649	120	11	163	8	922	1561	9	87	1001	164
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	2	2	2
Cap, veh/h	299	314	532	14	211	188	988	1801	785	110	1211	198
Arrive On Green	0.17	0.17	0.17	0.12	0.12	0.12	0.28	0.50	0.50	0.06	0.27	0.27
Sat Flow, veh/h	1795	1885	3195	118	1747	1555	3483	3582	1561	1781	4407	720
Grp Volume(v), veh/h	560	649	120	174	0	8	922	1561	9	87	773	392
Grp Sat Flow(s),veh/h/ln	1795	1885	1598	1864	0	1555	1742	1791	1561	1781	1702	1723
Q Serve(g_s), s	18.0	18.0	3.5	9.8	0.0	0.5	27.9	41.5	0.3	5.2	23.0	23.1
Cycle Q Clear(g_c), s	18.0	18.0	3.5	9.8	0.0	0.5	27.9	41.5	0.3	5.2	23.0	23.1
Prop In Lane	1.00		1.00	0.06		1.00	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	299	314	532	225	0	188	988	1801	785	110	935	473
V/C Ratio(X)	1.87	2.07	0.23	0.77	0.00	0.04	0.93	0.87	0.01	0.79	0.83	0.83
Avail Cap(c_a), veh/h	299	314	532	672	0	561	1063	1854	808	181	1070	542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.1	45.1	39.0	46.1	0.0	42.0	37.7	23.7	13.4	50.0	36.8	37.0
Incr Delay (d2), s/veh	406.0	491.8	0.1	2.1	0.0	0.0	13.3	4.3	0.0	4.6	4.2	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	50.9	1.3	4.5	0.0	0.2	13.1	16.8	0.1	2.5	10.0	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	451.1	536.9	39.1	48.2	0.0	42.1	51.1	28.0	13.4	54.7	41.0	45.2
LnGrp LOS	F	F	D	D	A	D	D	C	B	D	D	D
Approach Vol, veh/h	1329			182			2492			1252		
Approach Delay, s/veh	455.8			48.0			36.5			43.3		
Approach LOS	F			D			D			D		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	0.7	58.4	22.0		34.7	34.4	17.1					
Change Period (Y+Rc), s	4.0	5.3	4.9		4.0	* 5.3	4.0					
Max Green Setting (Gmax),s	1.0	54.7	17.1		33.0	* 33	39.0					
Max Q Clear Time (g_c+17),s	1.0	43.5	20.0		29.9	25.1	11.8					
Green Ext Time (p_c), s	0.0	5.7	0.0		0.8	3.6	0.5					

### Intersection Summary

HCM 6th Ctrl Delay 144.5

HCM 6th LOS F

### Notes

User approved volume balancing among the lanes for turning movement.













\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1052	207	200	1424	80	330	150	180	70	180	120
Future Volume (veh/h)	50	1052	207	200	1424	80	330	150	180	70	180	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	54	1143	117	217	1548	16	359	163	22	76	196	112
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	70	1290	566	246	1641	715	420	593	490	97	276	158
Arrive On Green	0.04	0.36	0.36	0.14	0.46	0.46	0.12	0.31	0.31	0.05	0.25	0.24
Sat Flow, veh/h	1795	3582	1573	1795	3582	1561	3483	1885	1556	1810	1116	638
Grp Volume(v), veh/h	54	1143	117	217	1548	16	359	163	22	76	0	308
Grp Sat Flow(s),veh/h/ln	1795	1791	1573	1795	1791	1561	1742	1885	1556	1810	0	1754
Q Serve(g_s), s	3.5	35.6	6.1	14.1	49.0	0.7	12.0	7.7	1.2	4.9	0.0	19.1
Cycle Q Clear(g_c), s	3.5	35.6	6.1	14.1	49.0	0.7	12.0	7.7	1.2	4.9	0.0	19.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	70	1290	566	246	1641	715	420	593	490	97	0	434
V/C Ratio(X)	0.77	0.89	0.21	0.88	0.94	0.02	0.85	0.27	0.04	0.78	0.00	0.71
Avail Cap(c_a), veh/h	136	1290	566	363	1700	741	557	755	624	168	0	585
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.6	35.7	26.3	50.3	30.7	17.6	51.2	30.6	28.3	55.5	0.0	41.0
Incr Delay (d2), s/veh	6.6	7.5	0.1	11.8	10.7	0.0	7.8	0.1	0.0	5.1	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	16.1	2.2	7.0	21.9	0.2	5.5	3.4	0.4	2.3	0.0	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.2	43.2	26.3	62.1	41.4	17.6	59.0	30.6	28.3	60.6	0.0	42.3
LnGrp LOS	E	D	C	E	D	B	E	C	C	E	A	D
Approach Vol, veh/h	1314			1781			544			384		
Approach Delay, s/veh	42.5			43.8			49.2			45.9		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	41.4	20.3	46.8	18.3	33.4	8.6	58.4					
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	46.3	24.0	* 41	19.0	38.3	9.0	* 56					
Max Q Clear Time (g_c+16, s)	9.7	16.1	37.6	14.0	21.1	5.5	51.0					
Green Ext Time (p_c), s	0.0	0.5	0.2	1.9	0.3	1.0	0.0	3.2				

### Intersection Summary

HCM 6th Ctrl Delay 44.3

HCM 6th LOS D





























### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way






























The Ranch  
Cumulative Plus Phase 2 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 		 	 	
Traffic Volume (veh/h)	40	760	348	301	970	310	554	416	146	390	601	30
Future Volume (veh/h)	40	760	348	301	970	310	554	416	146	390	601	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	43	826	125	327	1054	129	602	452	136	424	653	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	55	1176	177	353	1979	242	545	726	217	483	873	40
Arrive On Green	0.03	0.26	0.26	0.20	0.43	0.43	0.16	0.27	0.26	0.14	0.25	0.24
Sat Flow, veh/h	1795	4477	672	1781	4602	562	3483	2702	805	3483	3481	160
Grp Volume(v), veh/h	43	631	320	327	779	404	602	298	290	424	336	347
Grp Sat Flow(s),veh/h/ln	1795	1716	1718	1781	1702	1760	1742	1791	1717	1742	1791	1850
Q Serve(g_s), s	2.9	20.2	20.5	21.9	20.5	20.6	19.0	17.7	18.1	14.5	21.0	21.0
Cycle Q Clear(g_c), s	2.9	20.2	20.5	21.9	20.5	20.6	19.0	17.7	18.1	14.5	21.0	21.0
Prop In Lane	1.00		0.39	1.00		0.32	1.00		0.47	1.00		0.09
Lane Grp Cap(c), veh/h	55	902	451	353	1464	757	545	481	461	483	449	464
V/C Ratio(X)	0.78	0.70	0.71	0.93	0.53	0.53	1.10	0.62	0.63	0.88	0.75	0.75
Avail Cap(c_a), veh/h	89	1074	538	396	1654	855	545	575	551	574	590	610
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	40.4	40.5	47.8	25.6	25.6	51.2	38.9	39.3	51.3	41.9	42.0
Incr Delay (d2), s/veh	8.4	1.1	2.4	24.9	0.1	0.2	70.3	0.7	0.8	11.6	2.4	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	8.4	8.7	11.8	7.9	8.2	13.4	7.6	7.5	6.9	9.3	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.8	41.6	42.9	72.7	25.7	25.8	121.5	39.6	40.2	62.9	44.3	44.4
LnGrp LOS	E	D	D	E	C	C	F	D	D	E	D	D
Approach Vol, veh/h		994			1510			1190			1107	
Approach Delay, s/veh		43.1			35.9			81.2			51.4	
Approach LOS		D			D			F			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.8	36.6	28.1	35.9	23.0	34.5	7.7	56.2				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	20.0	37.7	27.0	36.7	19.0	38.7	6.0	57.7				
Max Q Clear Time (g_c+I1), s	16.5	20.1	23.9	22.5	21.0	23.0	4.9	22.6				
Green Ext Time (p_c), s	0.3	1.9	0.2	3.3	0.0	2.1	0.0	5.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			52.2									
HCM 6th LOS			D									

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 		 	 	
Traffic Volume (veh/h)	320	952	120	110	1220	310	300	498	260	480	223	322
Future Volume (veh/h)	320	952	120	110	1220	310	300	498	260	480	223	322
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	337	1002	49	116	1284	133	316	524	212	505	235	192
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	238	1914	93	145	1693	523	221	666	269	358	885	387
Arrive On Green	0.13	0.38	0.38	0.08	0.33	0.33	0.12	0.27	0.25	0.10	0.25	0.25
Sat Flow, veh/h	1781	4983	243	1781	5106	1578	1795	2491	1003	3483	3582	1568
Grp Volume(v), veh/h	337	684	367	116	1284	133	316	376	360	505	235	192
Grp Sat Flow(s),veh/h/ln	1781	1702	1822	1781	1702	1578	1795	1791	1703	1742	1791	1568
Q Serve(g_s), s	13.0	15.1	15.1	6.2	21.8	6.0	12.0	19.0	19.1	10.0	5.1	10.2
Cycle Q Clear(g_c), s	13.0	15.1	15.1	6.2	21.8	6.0	12.0	19.0	19.1	10.0	5.1	10.2
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.59	1.00		1.00
Lane Grp Cap(c), veh/h	238	1307	700	145	1693	523	221	479	456	358	885	387
V/C Ratio(X)	1.42	0.52	0.52	0.80	0.76	0.25	1.43	0.78	0.79	1.41	0.27	0.50
Avail Cap(c_a), veh/h	238	1690	904	201	2430	751	221	823	782	358	1572	688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.2	23.1	23.1	43.9	29.0	23.7	42.7	33.0	33.5	43.7	29.5	31.4
Incr Delay (d2), s/veh	210.2	0.1	0.2	10.0	0.4	0.1	216.4	1.1	1.2	200.8	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.3	5.6	6.1	3.0	8.4	2.1	18.4	7.9	7.6	14.1	2.1	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	252.3	23.2	23.3	53.9	29.5	23.8	259.0	34.1	34.6	244.4	29.6	31.8
LnGrp LOS	F	C	C	D	C	C	F	C	C	F	C	C
Approach Vol, veh/h		1388			1533			1052			932	
Approach Delay, s/veh		78.9			30.8			101.9			146.5	
Approach LOS		E			C			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	30.0	11.9	41.4	16.0	28.0	17.0	36.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	10.0	43.4	11.0	47.0	12.0	41.4	13.0	45.0				
Max Q Clear Time (g_c+I1), s	12.0	21.1	8.2	17.1	14.0	12.2	15.0	23.8				
Green Ext Time (p_c), s	0.0	2.6	0.0	4.4	0.0	1.2	0.0	6.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			81.6									
HCM 6th LOS			F									

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1810	850	290	1503	0	0	0	0	790	10	920
Future Volume (veh/h)	0	1810	850	290	1503	0	0	0	0	790	10	920
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1967	456	315	1634	0				867	0	972
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	1	1	0				2	2	2
Cap, veh/h	0	1691	524	226	2426	0				1680	0	747
Arrive On Green	0.00	0.33	0.33	0.11	0.47	0.00				0.47	0.00	0.47
Sat Flow, veh/h	0	5316	1596	1975	5316	0				3563	0	1585
Grp Volume(v), veh/h	0	1967	456	315	1634	0				867	0	972
Grp Sat Flow(s),veh/h/ln	0	1716	1596	987	1716	0				1781	0	1585
Q Serve(g_s), s	0.0	46.0	37.6	16.0	34.4	0.0				23.8	0.0	66.0
Cycle Q Clear(g_c), s	0.0	46.0	37.6	16.0	34.4	0.0				23.8	0.0	66.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1691	524	226	2426	0				1680	0	747
V/C Ratio(X)	0.00	1.16	0.87	1.40	0.67	0.00				0.52	0.00	1.30
Avail Cap(c_a), veh/h	0	1691	524	226	2426	0				1680	0	747
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	47.0	44.2	62.0	28.7	0.0				25.8	0.0	37.0
Incr Delay (d2), s/veh	0.0	80.4	14.0	202.7	0.6	0.0				0.1	0.0	145.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	31.5	16.4	10.3	13.7	0.0				9.8	0.0	54.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	127.4	58.2	264.7	29.3	0.0				26.0	0.0	182.1
LnGrp LOS	A	F	E	F	C	A				C	A	F
Approach Vol, veh/h		2423			1949						1839	
Approach Delay, s/veh		114.4			67.3						108.5	
Approach LOS		F			E						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	30.0	50.0		70.0		70.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	60.0	44.7		64.7		64.7						
Max Q Clear Time (g_c+I1), s	11.0	48.0		68.0		36.4						
Green Ext Time (p_c), s	0.0	0.0		0.0		8.8						

### Intersection Summary

HCM 6th Ctrl Delay 97.9  
HCM 6th LOS F

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↑	↑	↑↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	1930	670	170	1033	620	760	50	930	0	0	0
Future Volume (veh/h)	0	1930	670	170	1033	620	760	50	930	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	0	2098	449	185	1123	321	865	0	876			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2			
Cap, veh/h	0	2042	633	163	2681	809	1455	0	647			
Arrive On Green	0.00	0.40	0.40	0.09	0.52	0.52	0.41	0.00	0.41			
Sat Flow, veh/h	0	5274	1583	1781	5106	1540	3563	0	1584			
Grp Volume(v), veh/h	0	2098	449	185	1123	321	865	0	876			
Grp Sat Flow(s),veh/h/ln	0	1702	1583	1781	1702	1540	1781	0	1584			
Q Serve(g_s), s	0.0	48.0	28.5	11.0	16.1	15.0	22.8	0.0	49.0			
Cycle Q Clear(g_c), s	0.0	48.0	28.5	11.0	16.1	15.0	22.8	0.0	49.0			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2042	633	163	2681	809	1455	0	647			
V/C Ratio(X)	0.00	1.03	0.71	1.13	0.42	0.40	0.59	0.00	1.35			
Avail Cap(c_a), veh/h	0	2042	633	163	2681	809	1455	0	647			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	36.0	30.2	54.5	17.4	17.1	27.7	0.0	35.5			
Incr Delay (d2), s/veh	0.0	27.2	3.2	110.6	0.0	0.1	0.5	0.0	169.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	23.8	10.8	9.8	5.9	5.0	9.3	0.0	48.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	63.2	33.3	165.1	17.4	17.2	28.2	0.0	205.0			
LnGrp LOS	A	F	C	F	B	B	C	A	F			
Approach Vol, veh/h		2547			1629			1741				
Approach Delay, s/veh		57.9			34.1			117.2				
Approach LOS		E			C			F				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.0	52.0		53.0		67.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	1.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+I1), s	1.0	50.0		51.0		18.1						
Green Ext Time (p_c), s	0.0	0.0		0.0		6.3						

### Intersection Summary

HCM 6th Ctrl Delay 68.8

HCM 6th LOS E

### Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	170	10	10	70	370	10	160	20	417	310	80
Future Volume (veh/h)	80	170	10	10	70	370	10	160	20	417	310	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.95	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	87	185	10	11	76	251	11	174	11	453	337	69
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	3	1	1	1	1	1	1
Cap, veh/h	138	498	27	104	98	324	105	498	31	497	1077	218
Arrive On Green	0.08	0.28	0.28	0.06	0.27	0.27	0.06	0.15	0.13	0.28	0.36	0.34
Sat Flow, veh/h	1781	1757	95	1767	370	1223	1795	3411	214	1795	2961	598
Grp Volume(v), veh/h	87	0	195	11	0	327	11	91	94	453	202	204
Grp Sat Flow(s),veh/h/ln	1781	0	1851	1767	0	1593	1795	1791	1834	1795	1791	1768
Q Serve(g_s), s	3.2	0.0	5.7	0.4	0.0	12.9	0.4	3.1	3.2	16.6	5.5	5.7
Cycle Q Clear(g_c), s	3.2	0.0	5.7	0.4	0.0	12.9	0.4	3.1	3.2	16.6	5.5	5.7
Prop In Lane	1.00		0.05	1.00		0.77	1.00		0.12	1.00		0.34
Lane Grp Cap(c), veh/h	138	0	525	104	0	422	105	261	268	497	652	643
V/C Ratio(X)	0.63	0.00	0.37	0.11	0.00	0.77	0.10	0.35	0.35	0.91	0.31	0.32
Avail Cap(c_a), veh/h	288	0	979	286	0	842	554	1342	1374	554	1342	1325
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.5	0.0	19.5	30.3	0.0	23.1	30.3	26.2	26.2	23.8	15.5	15.7
Incr Delay (d2), s/veh	1.8	0.0	0.2	0.2	0.0	1.2	0.2	0.3	0.3	17.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	2.2	0.2	0.0	4.4	0.2	1.2	1.3	8.5	1.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.2	0.0	19.7	30.5	0.0	24.3	30.5	26.4	26.5	41.2	15.6	15.8
LnGrp LOS	C	A	B	C	A	C	C	C	C	D	B	B
Approach Vol, veh/h	282				338		196				859	
Approach Delay, s/veh	23.6				24.5		26.7				29.2	
Approach LOS	C				C		C				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	2.8	13.9	8.0	23.3	8.0	28.8	9.3	22.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	1.0	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+I1), s	1.0	5.2	2.4	7.7	2.4	7.7	5.2	14.9				
Green Ext Time (p_c), s	0.2	0.6	0.0	0.6	0.0	1.4	0.0	1.2				

## Intersection Summary

HCM 6th Ctrl Delay	27.0
HCM 6th LOS	C











# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	210	226	281	210	160	159	905	183	150	1223	140
Future Volume (veh/h)	140	210	226	281	210	160	159	905	183	150	1223	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	152	228	212	305	228	149	173	984	179	163	1329	143
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	179	242	225	302	357	233	137	974	177	183	1131	121
Arrive On Green	0.10	0.27	0.27	0.17	0.34	0.34	0.08	0.32	0.31	0.10	0.35	0.34
Sat Flow, veh/h	1795	892	829	1781	1047	684	1795	3025	550	1795	3254	348
Grp Volume(v), veh/h	152	0	440	305	0	377	173	582	581	163	728	744
Grp Sat Flow(s),veh/h/ln	1795	0	1721	1781	0	1731	1795	1791	1783	1795	1791	1812
Q Serve(g_s), s	9.8	0.0	29.5	20.0	0.0	21.7	9.0	38.0	38.0	10.6	41.0	41.0
Cycle Q Clear(g_c), s	9.8	0.0	29.5	20.0	0.0	21.7	9.0	38.0	38.0	10.6	41.0	41.0
Prop In Lane	1.00		0.48	1.00		0.40	1.00		0.31	1.00		0.19
Lane Grp Cap(c), veh/h	179	0	467	302	0	590	137	577	574	183	622	629
V/C Ratio(X)	0.85	0.00	0.94	1.01	0.00	0.64	1.26	1.01	1.01	0.89	1.17	1.18
Avail Cap(c_a), veh/h	228	0	496	302	0	590	137	577	574	183	622	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.2	0.0	42.1	49.0	0.0	32.8	54.5	40.0	40.2	52.4	38.5	38.6
Incr Delay (d2), s/veh	17.1	0.0	25.3	54.5	0.0	1.8	164.1	39.9	40.5	37.2	92.9	97.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	15.3	13.2	0.0	9.0	10.2	22.3	22.3	6.5	33.1	34.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.4	0.0	67.4	103.5	0.0	34.6	218.6	79.9	80.7	89.6	131.4	136.2
LnGrp LOS	E	A	E	F	A	C	F	F	F	F	F	F
Approach Vol, veh/h	592		682			1336			1635			
Approach Delay, s/veh	67.9		65.4			98.2			129.4			
Approach LOS	E		E			F			F			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	42.0	24.0	36.0	13.0	45.0	15.8	44.2					
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	36.7	20.0	34.0	9.0	39.7	15.0	39.0					
Max Q Clear Time (g_c+I1), s	40.0	22.0	31.5	11.0	43.0	11.8	23.7					
Green Ext Time (p_c), s	0.0	0.0	0.0	0.5	0.0	0.0	0.1	1.2				
Intersection Summary												
HCM 6th Ctrl Delay	100.7											
HCM 6th LOS	F											












# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	0	9	50	0	170	4	1137	70	360	1108	73
Future Volume (veh/h)	145	0	9	50	0	170	4	1137	70	360	1108	73
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	0	1900	1870	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	158	0	10	54	0	7	4	1236	42	391	1204	79
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	0	0	2	1	1	1	1	1
Cap, veh/h	328	0	234	0	0	0	301	1510	656	416	2455	161
Arrive On Green	0.15	0.00	0.14	0.00	0.00	0.00	0.42	0.42	0.42	0.23	0.72	0.70
Sat Flow, veh/h	1409	0	1585		0		431	3582	1557	1795	3412	224
Grp Volume(v), veh/h	158	0	10		0.0		4	1236	42	391	631	652
Grp Sat Flow(s),veh/h/ln	1409	0	1585				431	1791	1557	1795	1791	1845
Q Serve(g_s), s	6.5	0.0	0.3				0.3	18.4	1.0	12.9	9.2	9.3
Cycle Q Clear(g_c), s	6.5	0.0	0.3				0.3	18.4	1.0	12.9	9.2	9.3
Prop In Lane	1.00		1.00				1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	328	0	234				301	1510	656	416	1289	1328
V/C Ratio(X)	0.48	0.00	0.04				0.01	0.82	0.06	0.94	0.49	0.49
Avail Cap(c_a), veh/h	912	0	893				333	1780	773	416	1424	1467
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.7	0.0	22.3				10.2	15.4	10.4	22.8	3.7	3.7
Incr Delay (d2), s/veh	1.1	0.0	0.1				0.0	2.3	0.0	28.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	0.1				0.0	6.3	0.3	8.0	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	0.0	22.3				10.2	17.7	10.4	51.7	3.8	3.8
LnGrp LOS	C	A	C				B	B	B	D	A	A
Approach Vol, veh/h	168						1282			1674		
Approach Delay, s/veh	25.6						17.5			15.0		
Approach LOS	C						B			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	8.0	29.5	12.9		47.5							
Change Period (Y+Rc), s	4.0	5.3	4.5		5.3							
Max Green Setting (Gmax), s	4.0	28.7	33.5		46.7							
Max Q Clear Time (g_c+14.5), s	4.0	20.4	8.5		11.3							
Green Ext Time (p_c), s	0.0	3.7	0.5		5.6							

### Intersection Summary













HCM 6th Ctrl Delay	16.6
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	114	26	90	104	452	12	462	70	570	699	36
Future Volume (veh/h)	76	114	26	90	104	452	12	462	70	570	699	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	83	124	28	98	113	73	13	502	66	620	760	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	145	187	158	155	224	135	24	796	104	813	1627	81
Arrive On Green	0.08	0.10	0.10	0.09	0.10	0.10	0.01	0.25	0.22	0.23	0.47	0.44
Sat Flow, veh/h	1810	1900	1605	1795	2147	1292	1810	3204	419	3483	3471	174
Grp Volume(v), veh/h	83	124	28	98	93	93	13	282	286	620	392	406
Grp Sat Flow(s),veh/h/ln	1810	1900	1605	1795	1791	1648	1810	1805	1818	1742	1791	1854
Q Serve(g_s), s	2.1	3.0	0.8	2.5	2.4	2.6	0.3	6.7	6.8	8.0	7.1	7.2
Cycle Q Clear(g_c), s	2.1	3.0	0.8	2.5	2.4	2.6	0.3	6.7	6.8	8.0	7.1	7.2
Prop In Lane	1.00		1.00	1.00		0.78	1.00		0.23	1.00		0.09
Lane Grp Cap(c), veh/h	145	187	158	155	187	172	24	449	452	813	839	869
V/C Ratio(X)	0.57	0.66	0.18	0.63	0.50	0.54	0.54	0.63	0.63	0.76	0.47	0.47
Avail Cap(c_a), veh/h	641	1703	1439	412	1381	1271	189	1241	1250	2686	2426	2511
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	20.9	19.9	21.2	20.3	20.4	23.5	16.1	16.2	17.2	8.7	8.7
Incr Delay (d2), s/veh	3.5	1.5	0.2	4.2	0.8	1.0	6.9	0.5	0.5	0.6	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.2	0.2	1.1	0.9	0.9	0.2	2.2	2.3	2.8	2.1	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	22.4	20.1	25.4	21.1	21.4	30.4	16.6	16.8	17.7	8.8	8.9
LnGrp LOS	C	C	C	C	C	C	C	B	B	B	A	A
Approach Vol, veh/h	235			284			581			1418		
Approach Delay, s/veh	23.0			22.6			17.0			12.7		
Approach LOS	C			C			B			B		
Timer - Assigned Phs												
	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.2	15.9	8.1	8.7	4.6	26.5	7.8	9.0				
Change Period (Y+Rc), s	4.0	5.3	4.5	4.0	4.0	5.3	4.5	4.0				
Max Green Setting (Gmax), s	31.7	31.7	10.5	43.0	5.0	63.7	16.5	37.0				
Max Q Clear Time (g_c+I10), s	8.8	8.8	4.5	5.0	2.3	9.2	4.1	4.6				
Green Ext Time (p_c), s	1.2	1.9	0.1	0.4	0.0	3.6	0.1	0.6				

### Intersection Summary









HCM 6th Ctrl Delay	15.8
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	646	30	90	901	130	150	210	270	120	50	152
Future Volume (veh/h)	115	646	30	90	901	130	150	210	270	120	50	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	125	702	29	98	979	130	163	228	92	130	54	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	159	1253	52	130	1086	144	198	835	327	164	601	467
Arrive On Green	0.09	0.36	0.36	0.07	0.34	0.34	0.11	0.33	0.33	0.09	0.32	0.31
Sat Flow, veh/h	1781	3478	144	1781	3153	419	1781	2495	976	1781	1902	1479
Grp Volume(v), veh/h	125	359	372	98	551	558	163	160	160	130	50	51
Grp Sat Flow(s),veh/h/ln	1781	1777	1845	1781	1777	1795	1781	1777	1695	1781	1777	1604
Q Serve(g_s), s	7.9	18.5	18.6	6.2	33.8	33.9	10.3	7.6	8.0	8.2	2.3	2.6
Cycle Q Clear(g_c), s	7.9	18.5	18.6	6.2	33.8	33.9	10.3	7.6	8.0	8.2	2.3	2.6
Prop In Lane	1.00		0.08	1.00		0.23	1.00		0.58	1.00		0.92
Lane Grp Cap(c), veh/h	159	640	665	130	612	618	198	595	567	164	561	506
V/C Ratio(X)	0.79	0.56	0.56	0.75	0.90	0.90	0.82	0.27	0.28	0.79	0.09	0.10
Avail Cap(c_a), veh/h	176	640	665	205	652	659	224	595	567	196	561	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.2	29.4	29.4	52.1	35.7	35.8	49.8	27.9	28.1	51.0	27.6	27.9
Incr Delay (d2), s/veh	19.2	1.1	1.1	8.4	15.2	15.1	19.4	1.1	1.2	16.7	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	7.7	8.0	3.0	16.4	16.6	5.5	3.3	3.3	4.3	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.3	30.5	30.5	60.5	50.9	50.9	69.3	29.0	29.4	67.6	27.9	28.3
LnGrp LOS	E	C	C	E	D	D	E	C	C	E	C	C
Approach Vol, veh/h	856			1207			483			231		
Approach Delay, s/veh	36.3			51.7			42.7			50.3		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.6	42.4	12.4	45.3	16.8	40.2	14.2	43.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	37.5	12.7	39.7	13.9	35.7	10.8	41.6					
Max Q Clear Time (g_c+10), s	10.0	8.2	20.6	12.3	4.6	9.9	35.9					
Green Ext Time (p_c), s	0.1	1.7	0.1	3.9	0.1	0.5	0.0	3.1				

### Intersection Summary

HCM 6th Ctrl Delay 45.3

HCM 6th LOS D

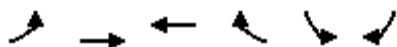
### Notes

User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

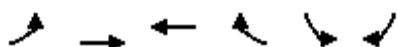
The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	78	958	1065	880	310	56
Future Volume (veh/h)	78	958	1065	880	310	56
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	1008	1121	453	326	18
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	118	2067	1618	722	1033	474
Arrive On Green	0.07	0.58	0.46	0.46	0.30	0.30
Sat Flow, veh/h	1781	3647	3647	1585	3456	1585
Grp Volume(v), veh/h	82	1008	1121	453	326	18
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1728	1585
Q Serve(g_s), s	3.0	11.1	16.8	14.6	4.9	0.5
Cycle Q Clear(g_c), s	3.0	11.1	16.8	14.6	4.9	0.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	118	2067	1618	722	1033	474
V/C Ratio(X)	0.69	0.49	0.69	0.63	0.32	0.04
Avail Cap(c_a), veh/h	213	3292	2655	1184	1033	474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	8.2	14.5	13.9	18.2	16.6
Incr Delay (d2), s/veh	7.0	0.2	0.5	0.9	0.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	3.0	5.5	4.3	1.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.6	8.4	15.0	14.8	19.0	16.8
LnGrp LOS	D	A	B	B	B	B
Approach Vol, veh/h		1090	1574		344	
Approach Delay, s/veh		10.6	15.0		18.9	
Approach LOS		B	B		B	
Timer - Assigned Phs			4	6	7	8
Phs Duration (G+Y+Rc), s			42.9	24.0	8.4	34.5
Change Period (Y+Rc), s			4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s			61.5	19.5	7.5	49.5
Max Q Clear Time (g_c+I1), s			13.1	6.9	5.0	18.8
Green Ext Time (p_c), s			8.1	0.9	0.0	11.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			13.8			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	362	1045	1838	570	960	187
Future Volume (veh/h)	362	1045	1838	570	960	187
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	381	1100	1935	392	1011	72
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	312	3617	1777	793	784	359
Arrive On Green	0.17	0.71	0.50	0.50	0.22	0.22
Sat Flow, veh/h	1781	5274	3647	1585	3483	1598
Grp Volume(v), veh/h	381	1100	1935	392	1011	72
Grp Sat Flow(s),veh/h/ln	1781	1702	1777	1585	1742	1598
Q Serve(g_s), s	21.0	9.6	60.0	19.7	27.0	4.4
Cycle Q Clear(g_c), s	21.0	9.6	60.0	19.7	27.0	4.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	312	3617	1777	793	784	359
V/C Ratio(X)	1.22	0.30	1.09	0.49	1.29	0.20
Avail Cap(c_a), veh/h	312	3617	1777	793	784	359
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	6.5	30.0	19.9	46.5	37.7
Incr Delay (d2), s/veh	125.3	0.0	50.0	0.2	140.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	2.9	35.6	6.9	26.5	1.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	174.8	6.5	80.0	20.1	186.5	37.8
LnGrp LOS	F	A	F	C	F	D
Approach Vol, veh/h		1481	2327		1083	
Approach Delay, s/veh		49.8	69.9		176.7	
Approach LOS		D	E		F	
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		89.0			25.0	64.0
Change Period (Y+Rc), s		5.3			4.5	5.3
Max Green Setting (Gmax), s		83.7			20.5	58.7
Max Q Clear Time (g_c+I1), s		11.6			23.0	62.0
Green Ext Time (p_c), s		5.4			0.0	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			87.5			
HCM 6th LOS			F			

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑↑			↑↑	↖	↖	↖	↖			
Traffic Volume (veh/h)	509	1496	0	0	1842	1170	566	10	220	0	0	0
Future Volume (veh/h)	509	1496	0	0	1842	1170	566	10	220	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1885	1885	0	0	1885	1885	1856	1856	1856			
Adj Flow Rate, veh/h	553	1626	0	0	2038	1013	623	0	192			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	1	1	0	0	1	1	3	3	3			
Cap, veh/h	407	3588	0	0	2028	859	770	0	343			
Arrive On Green	0.12	0.70	0.00	0.00	0.54	0.54	0.22	0.00	0.22			
Sat Flow, veh/h	3483	5316	0	0	3770	1598	3534	0	1572			
Grp Volume(v), veh/h	553	1626	0	0	2038	1013	623	0	192			
Grp Sat Flow(s),veh/h/ln	1742	1716	0	0	1885	1598	1767	0	1572			
Q Serve(g_s), s	11.0	13.2	0.0	0.0	50.7	50.7	15.8	0.0	10.3			
Cycle Q Clear(g_c), s	11.0	13.2	0.0	0.0	50.7	50.7	15.8	0.0	10.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	407	3588	0	0	2028	859	770	0	343			
V/C Ratio(X)	1.36	0.45	0.00	0.00	1.00	1.18	0.81	0.00	0.56			
Avail Cap(c_a), veh/h	407	3588	0	0	2028	859	1736	0	773			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	41.6	6.3	0.0	0.0	21.8	21.8	35.0	0.0	32.8			
Incr Delay (d2), s/veh	177.4	0.0	0.0	0.0	21.1	92.4	0.8	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.5	3.5	0.0	0.0	24.7	37.9	6.5	0.0	0.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	219.0	6.4	0.0	0.0	42.9	114.2	35.8	0.0	33.4			
LnGrp LOS	F	A	A	A	F	F	D	A	C			
Approach Vol, veh/h	2179			3051			815					
Approach Delay, s/veh	60.3			66.6			35.2					
Approach LOS	E			E			D					
Timer - Assigned Phs	2			4		5	6					
Phs Duration (G+Y+Rc), s	69.7			24.5		15.0	54.7					
Change Period (Y+Rc), s	5.3			5.3		4.0	5.3					
Max Green Setting (Gmax), s	64.4			45.0		11.0	49.4					
Max Q Clear Time (g_c+l1), s	15.2			17.8		13.0	52.7					
Green Ext Time (p_c), s	9.6			1.5		0.0	0.0					

### Intersection Summary




HCM 6th Ctrl Delay	60.1
HCM 6th LOS	E

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour

Intersection						
Int Delay, s/veh	188.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	120	531	53	50	498	127
Future Vol, veh/h	120	531	53	50	498	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	130	577	58	54	541	138
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1305	85	0	0	112	0
Stage 1	85	-	-	-	-	-
Stage 2	1220	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	178	980	-	-	1490	-
Stage 1	943	-	-	-	-	-
Stage 2	282	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 108	980	-	-	1490	-
Mov Cap-2 Maneuver	~ 108	-	-	-	-	-
Stage 1	943	-	-	-	-	-
Stage 2	171	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s\$	391.9	0		7		
HCM LOS	F					
Minor Lane/Major Mvmt		NBT	NBRWBLn1	SBL	SBT	
Capacity (veh/h)		-	- 394	1490	-	
HCM Lane V/C Ratio		-	- 1.796	0.363	-	
HCM Control Delay (s)		-	-\$ 391.9	8.8	0	
HCM Lane LOS		-	- F	A	A	
HCM 95th %tile Q(veh)		-	- 45.1	1.7	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

# HCM 6th Signalized Intersection Summary

## 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↗↗	↗↗↗	↰	↰	↗↗	
Traffic Volume (veh/h)	340	1477	946	100	480	910	
Future Volume (veh/h)	340	1477	946	100	480	910	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1870	1870	1796	1796	
Adj Flow Rate, veh/h	370	1605	1028	0	522	605	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	1	1	2	2	7	7	
Cap, veh/h	419	1720	1684		787	1232	
Arrive On Green	0.12	0.48	0.33	0.00	0.46	0.46	
Sat Flow, veh/h	3483	3676	5274	1585	1711	2679	
Grp Volume(v), veh/h	370	1605	1028	0	522	605	
Grp Sat Flow(s),veh/h/ln	1742	1791	1702	1585	1711	1340	
Q Serve(g_s), s	15.7	63.3	25.3	0.0	35.6	23.6	
Cycle Q Clear(g_c), s	15.7	63.3	25.3	0.0	35.6	23.6	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	419	1720	1684		787	1232	
V/C Ratio(X)	0.88	0.93	0.61		0.66	0.49	
Avail Cap(c_a), veh/h	546	1898	1753		787	1232	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	64.9	36.7	42.2	0.0	31.5	28.3	
Incr Delay (d2), s/veh	10.9	8.2	0.4	0.0	1.7	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	7.5	28.3	10.5	0.0	15.1	19.4	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	75.8	44.9	42.6	0.0	33.2	28.4	
LnGrp LOS	E	D	D		C	C	
Approach Vol, veh/h							
		1975	1028	A	1127		
Approach Delay, s/veh							
		50.7	42.6		30.6		
Approach LOS							
		D	D		C		
Timer - Assigned Phs							
				4	6	7	8
Phs Duration (G+Y+Rc), s				76.5	73.5	22.6	54.0
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				79.5	61.5	23.5	51.5
Max Q Clear Time (g_c+I1), s				65.3	37.6	17.7	27.3
Green Ext Time (p_c), s				6.7	2.4	0.4	4.6
Intersection Summary							
HCM 6th Ctrl Delay			43.2				
HCM 6th LOS			D				

### Notes

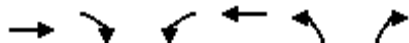
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary

## 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour














Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑	↘↘	↗
Traffic Volume (veh/h)	1237	731	0	1663	153	30
Future Volume (veh/h)	1237	731	0	1663	153	30
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1345	595	0	1808	166	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	2089	932	0	2089	1240	569
Arrive On Green	0.59	0.59	0.00	0.59	0.36	0.36
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1345	595	0	1808	166	4
Grp Sat Flow(s),veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	37.6	37.1	0.0	64.0	4.9	0.2
Cycle Q Clear(g_c), s	37.6	37.1	0.0	64.0	4.9	0.2
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2089	932	0	2089	1240	569
V/C Ratio(X)	0.64	0.64	0.00	0.87	0.13	0.01
Avail Cap(c_a), veh/h	2748	1226	0	2748	1240	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	20.4	0.0	25.9	32.4	30.9
Incr Delay (d2), s/veh	0.3	0.7	0.0	2.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	13.8	0.0	25.8	2.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.8	21.1	0.0	28.4	32.6	30.9
LnGrp LOS	C	C	A	C	C	C
Approach Vol, veh/h	1940			1808	170	
Approach Delay, s/veh	20.9			28.4	32.6	
Approach LOS	C			C	C	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	57.8		92.2		92.2	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	25.5		115.5		115.5	
Max Q Clear Time (g_c+I1), s	6.9		39.6		66.0	
Green Ext Time (p_c), s	0.5		22.8		21.7	
Intersection Summary						
HCM 6th Ctrl Delay			24.9			
HCM 6th LOS			C			

# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Cumulative Plus Phase 2 AM Peak Hour





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	273	60	60	20	50	20	30	455	20	20	302	161
Future Volume (veh/h)	273	60	60	20	50	20	30	455	20	20	302	161
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	297	65	65	22	54	22	33	495	22	22	328	175
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	449	381	72	170	69	93	896	400	72	855	381
Arrive On Green	0.15	0.24	0.24	0.04	0.13	0.12	0.05	0.25	0.25	0.04	0.24	0.24
Sat Flow, veh/h	1781	1870	1585	1781	1263	515	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	297	65	65	22	0	76	33	495	22	22	328	175
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1778	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.5	1.0	1.2	0.5	0.0	1.5	0.7	4.5	0.4	0.5	2.9	3.5
Cycle Q Clear(g_c), s	5.5	1.0	1.2	0.5	0.0	1.5	0.7	4.5	0.4	0.5	2.9	3.5
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	449	381	72	0	239	93	896	400	72	855	381
V/C Ratio(X)	1.14	0.14	0.17	0.30	0.00	0.32	0.36	0.55	0.06	0.30	0.38	0.46
Avail Cap(c_a), veh/h	261	922	782	261	0	877	261	1847	824	261	1847	824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	11.2	11.3	17.5	0.0	14.8	17.2	12.2	10.6	17.5	11.9	12.2
Incr Delay (d2), s/veh	97.9	0.1	0.2	2.3	0.0	0.8	2.3	0.5	0.1	2.3	0.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	0.4	0.4	0.2	0.0	0.5	0.3	1.3	0.1	0.2	0.8	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	113.9	11.4	11.5	19.8	0.0	15.5	19.5	12.7	10.7	19.8	12.2	13.0
LnGrp LOS	F	B	B	B	A	B	B	B	B	B	B	B
Approach Vol, veh/h	427					98		550		525		
Approach Delay, s/veh	82.7					16.5		13.0		12.8		
Approach LOS	F					B		B		B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.5	13.5	5.5	13.0	6.0	13.0	9.5	9.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+12.5), s	12.5	6.5	2.5	3.2	2.7	5.5	7.5	3.5				
Green Ext Time (p_c), s	0.0	2.4	0.0	0.4	0.0	2.1	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay			31.8									
HCM 6th LOS			C									

# HCM 6th Signalized Intersection Summary

## 1: Lone Tree Way & State Route 4 (Westbound Ramps)

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	240	10	290	990	1166	0	0	814	580
Future Volume (veh/h)	0	0	0	240	10	290	990	1166	0	0	814	580
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	1885	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				261	11	256	1076	1267	0	0	885	630
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				1	1	1	1	1	0	0	1	1
Cap, veh/h				669	0	307	1161	2632	0	0	2368	582
Arrive On Green				0.19	0.19	0.19	0.33	0.73	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3483	0	1598	3483	3676	0	0	6749	1595
Grp Volume(v), veh/h				261	0	256	1076	1267	0	0	885	630
Grp Sat Flow(s),veh/h/ln				1742	0	1598	1742	1791	0	0	1621	1595
Q Serve(g_s), s				7.2	0.0	16.9	32.7	15.9	0.0	0.0	11.0	40.0
Cycle Q Clear(g_c), s				7.2	0.0	16.9	32.7	15.9	0.0	0.0	11.0	40.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				669	0	307	1161	2632	0	0	2368	582
V/C Ratio(X)				0.39	0.00	0.83	0.93	0.48	0.00	0.00	0.37	1.08
Avail Cap(c_a), veh/h				1367	0	627	1431	2910	0	0	2368	582
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				38.7	0.0	42.6	35.2	6.0	0.0	0.0	25.6	34.8
Incr Delay (d2), s/veh				0.1	0.0	2.3	8.5	0.1	0.0	0.0	0.0	61.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.0	0.0	6.6	14.4	4.4	0.0	0.0	4.0	24.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				38.8	0.0	44.9	43.7	6.0	0.0	0.0	25.6	96.2
LnGrp LOS				D	A	D	D	A	A	A	C	F
Approach Vol, veh/h					517			2343			1515	
Approach Delay, s/veh					41.8			23.3			55.0	
Approach LOS					D			C			D	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	84.5			40.5			44.0			25.0		
Change Period (Y+Rc), s	5.3			4.0			5.3			5.3		
Max Green Setting (Gmax), s	87.7			45.0			38.7			41.7		
Max Q Clear Time (g_c+I1), s	17.9			34.7			42.0			18.9		
Green Ext Time (p_c), s	6.7			1.9			0.0			0.9		
Intersection Summary												
HCM 6th Ctrl Delay	36.5											
HCM 6th LOS	D											

# HCM 6th Signalized Intersection Summary

## 2: Lone Tree Way & State Route 4 (Eastbound Ramps)

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	🚗🚗	🚗	🚗					🚗🚗🚗		🚗🚗	🚗🚗	
Traffic Volume (veh/h)	490	10	1045	0	0	0	0	1666	320	290	764	0
Future Volume (veh/h)	490	10	1045	0	0	0	0	1666	320	290	764	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	533	0	1143				0	1811	320	315	830	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1571	0	1398				0	1798	317	389	1657	0
Arrive On Green	0.44	0.00	0.44				0.00	0.32	0.31	0.11	0.46	0.00
Sat Flow, veh/h	3591	0	3195				0	5846	986	3483	3676	0
Grp Volume(v), veh/h	533	0	1143				0	1578	553	315	830	0
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1621	1704	1742	1791	0
Q Serve(g_s), s	9.1	0.0	29.2				0.0	30.0	30.0	8.2	15.1	0.0
Cycle Q Clear(g_c), s	9.1	0.0	29.2				0.0	30.0	30.0	8.2	15.1	0.0
Prop In Lane	1.00		1.00				0.00		0.58	1.00		0.00
Lane Grp Cap(c), veh/h	1571	0	1398				0	1566	549	389	1657	0
V/C Ratio(X)	0.34	0.00	0.82				0.00	1.01	1.01	0.81	0.50	0.00
Avail Cap(c_a), veh/h	3276	0	2915				0	1566	549	486	1807	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.3	0.0	22.9				0.0	31.6	32.0	40.4	17.5	0.0
Incr Delay (d2), s/veh	0.1	0.0	1.2				0.0	24.5	40.4	6.5	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	10.0				0.0	14.3	17.6	3.7	5.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.4	0.0	24.2				0.0	56.1	72.4	46.9	17.6	0.0
LnGrp LOS	B	A	C				A	F	F	D	B	A
Approach Vol, veh/h	1676						2131			1145		
Approach Delay, s/veh	22.0						60.3			25.6		
Approach LOS	C						E			C		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	4.4	34.0	44.8	48.4								
Change Period (Y+Rc), s	4.0	5.3	4.5	* 5.3								
Max Green Setting (Gmax), s	3.0	28.7	84.5	* 47								
Max Q Clear Time (g_c+I10), s	10.2	32.0	31.2	17.1								
Green Ext Time (p_c), s	0.2	0.0	9.1	3.6								

### Intersection Summary

HCM 6th Ctrl Delay 39.3  
HCM 6th LOS D

### Notes

User approved volume balancing among the lanes for turning movement.
















\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 3: Hillcrest Avenue & Sunset Drive/Slatten Ranch

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



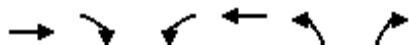
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  				 	  		 	
Traffic Volume (veh/h)	50	30	130	1020	120	210	460	700	1274	70	720	40
Future Volume (veh/h)	50	30	130	1020	120	210	460	700	1274	70	720	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	33	8	1109	130	177	500	761	603	76	783	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	76	18	1139	172	235	464	1756	1360	81	959	49
Arrive On Green	0.04	0.05	0.05	0.23	0.24	0.23	0.26	0.49	0.49	0.05	0.28	0.27
Sat Flow, veh/h	1781	1449	351	5023	718	977	1781	3554	2753	1781	3440	176
Grp Volume(v), veh/h	54	0	41	1109	0	307	500	761	603	76	404	419
Grp Sat Flow(s),veh/h/ln	1781	0	1800	1674	0	1695	1781	1777	1377	1781	1777	1839
Q Serve(g_s), s	2.7	0.0	2.0	19.3	0.0	14.9	23.0	12.2	12.5	3.8	18.7	18.8
Cycle Q Clear(g_c), s	2.7	0.0	2.0	19.3	0.0	14.9	23.0	12.2	12.5	3.8	18.7	18.8
Prop In Lane	1.00		0.20	1.00		0.58	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	69	0	95	1139	0	407	464	1756	1360	81	495	513
V/C Ratio(X)	0.78	0.00	0.43	0.97	0.00	0.75	1.08	0.43	0.44	0.94	0.82	0.82
Avail Cap(c_a), veh/h	202	0	673	1139	0	826	464	2699	2091	81	967	1000
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	0.0	40.6	33.9	0.0	31.3	32.6	14.4	14.5	42.0	29.7	29.8
Incr Delay (d2), s/veh	7.0	0.0	1.2	20.5	0.0	1.1	63.9	0.1	0.1	79.4	1.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.9	9.5	0.0	5.8	17.4	4.3	3.4	3.4	7.6	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.0	0.0	41.7	54.3	0.0	32.3	96.6	14.4	14.5	121.4	31.0	31.0
LnGrp LOS	D	A	D	D	A	C	F	B	B	F	C	C
Approach Vol, veh/h	95		1416				1864			899		
Approach Delay, s/veh	45.9		49.6				36.5			38.6		
Approach LOS	D		D				D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	47.6	24.0	8.6	27.0	28.6	7.4	25.2				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.6	4.0	4.9	4.0	4.6				
Max Green Setting (Gmax), s	4.0	66.1	20.0	32.4	23.0	47.1	10.0	42.4				
Max Q Clear Time (g_c+15), s	4.0	14.5	21.3	4.0	25.0	20.8	4.7	16.9				
Green Ext Time (p_c), s	0.0	5.0	0.0	0.1	0.0	2.9	0.0	1.1				

### Intersection Summary

HCM 6th Ctrl Delay 41.5  
HCM 6th LOS D

# HCM 6th Signalized Intersection Summary 4: SR 4 EB Ramps & Slatten Ranch

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑↑	↑
Traffic Volume (veh/h)	560	814	230	690	660	160
Future Volume (veh/h)	560	814	230	690	660	160
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	609	308	250	750	717	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	1103	488	427	989	919	421
Arrive On Green	0.32	0.32	0.13	0.54	0.27	0.27
Sat Flow, veh/h	3589	1548	3401	1841	3401	1560
Grp Volume(v), veh/h	609	308	250	750	717	38
Grp Sat Flow(s), veh/h/ln	1749	1548	1700	1841	1700	1560
Q Serve(g_s), s	6.0	7.1	2.9	13.2	8.1	0.8
Cycle Q Clear(g_c), s	6.0	7.1	2.9	13.2	8.1	0.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1103	488	427	989	919	421
V/C Ratio(X)	0.55	0.63	0.58	0.76	0.78	0.09
Avail Cap(c_a), veh/h	2947	1304	458	1976	1424	653
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.8	12.2	17.1	7.5	14.0	11.3
Incr Delay (d2), s/veh	0.2	0.5	1.7	0.5	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	1.7	1.0	2.4	2.6	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.0	12.7	18.8	8.0	14.6	11.4
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	917			1000	755	
Approach Delay, s/veh	12.2			10.7	14.5	
Approach LOS	B			B	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		15.2	9.2	17.1		26.3
Change Period (Y+Rc), s		4.0	4.5	4.6		4.6
Max Green Setting (Gmax), s		17.4	5.1	34.4		44.0
Max Q Clear Time (g_c+I1), s		10.1	4.9	9.1		15.2
Green Ext Time (p_c), s		1.1	0.0	3.0		3.1
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			12.3			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary

## 5: Hillcrest Avenue & State Route 4 Eastbound Ramps

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	🔴🔴		🔴🔴🔴					🔴🔴🔴		🔴🔴	🔴🔴🔴	
Traffic Volume (veh/h)	540	40	2409	0	0	0	0	1894	476	470	1040	0
Future Volume (veh/h)	540	40	2409	0	0	0	0	1894	476	470	1040	0
Initial Q (Qb), veh	0	0	20				0	20	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	587	43	2515				0	2059	491	511	1130	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1				0	1	1	1	1	0
Cap, veh/h	1384	0	1448				0	2049	137	321	2809	0
Arrive On Green	0.40	0.40	0.40				0.00	0.42	0.41	0.09	0.55	0.00
Sat Flow, veh/h	3483	0	3643				0	4878	976	3483	5316	0
Grp Volume(v), veh/h	587	0	2515				0	1691	859	511	1130	0
Grp Sat Flow(s),veh/h/ln	1742	0	1214				0	1131	1707	1742	1716	0
Q Serve(g_s), s	17.2	0.0	56.0				0.0	59.0	59.0	13.0	18.0	0.0
Cycle Q Clear(g_c), s	17.2	0.0	56.0				0.0	59.0	59.0	13.0	18.0	0.0
Prop In Lane	1.00		1.00				0.00		0.57	1.00		0.00
Lane Grp Cap(c), veh/h	1384	0	1448				0	1421	764	321	2809	0
V/C Ratio(X)	0.42	0.00	1.74				0.00	1.19	1.12	1.59	0.40	0.00
Avail Cap(c_a), veh/h	1384	0	1448				0	1421	715	321	2809	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.8	0.0	42.4				0.0	40.9	41.0	63.9	18.6	0.0
Incr Delay (d2), s/veh	0.1	0.0	334.7				0.0	93.0	72.0	279.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	49.7				0.0	38.0	23.5	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.0	67.6				0.0	32.9	45.5	18.1	6.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	0.0	426.8				0.0	171.9	136.6	343.8	18.7	0.0
LnGrp LOS	C	A	F				A	F	F	F	B	A
Approach Vol, veh/h		3102						2550			1641	
Approach Delay, s/veh		351.9						160.0			119.9	
Approach LOS		F						F			F	
Timer - Assigned Phs	1	2		4			6					
Phs Duration (G+Y+Rc), s	7.9	63.0		60.0			80.9					
Change Period (Y+Rc), s	4.9	* 4.9		5.3			4.9					
Max Green Setting (Gmax), s	58.0	* 58		54.7			75.1					
Max Q Clear Time (g_c+I1), s	61.0			58.0			20.0					
Green Ext Time (p_c), s	0.0	0.0		0.0			5.6					

### Intersection Summary

HCM 6th Ctrl Delay	232.6
HCM 6th LOS	F

### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



# HCM 6th Signalized Intersection Summary

## 6: Lone Tree Way & Davison Drive

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩	↩	↩	↩	↩	↩		↩	↩	↩
Traffic Volume (veh/h)	70	60	80	180	40	150	80	1046	160	220	1289	30
Future Volume (veh/h)	70	60	80	180	40	150	80	1046	160	220	1289	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	76	65	5	196	43	17	87	1137	166	239	1401	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	117	100	186	260	273	231	113	1389	202	330	1702	39
Arrive On Green	0.12	0.12	0.12	0.14	0.14	0.14	0.06	0.44	0.44	0.09	0.48	0.47
Sat Flow, veh/h	989	846	1577	1795	1885	1594	1795	3131	456	3483	3579	82
Grp Volume(v), veh/h	141	0	5	196	43	17	87	649	654	239	700	733
Grp Sat Flow(s), veh/h/ln	1836	0	1577	1795	1885	1594	1795	1791	1796	1742	1791	1870
Q Serve(g_s), s	5.9	0.0	0.2	8.4	1.6	0.7	3.8	25.5	25.7	5.4	27.1	27.2
Cycle Q Clear(g_c), s	5.9	0.0	0.2	8.4	1.6	0.7	3.8	25.5	25.7	5.4	27.1	27.2
Prop In Lane	0.54		1.00	1.00		1.00	1.00		0.25	1.00		0.04
Lane Grp Cap(c), veh/h	217	0	186	260	273	231	113	794	797	330	852	889
V/C Ratio(X)	0.65	0.00	0.03	0.75	0.16	0.07	0.77	0.82	0.82	0.72	0.82	0.82
Avail Cap(c_a), veh/h	798	0	686	847	890	752	357	1668	1673	692	1668	1742
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	0.0	31.4	33.0	30.1	29.8	37.2	19.5	19.7	35.4	18.2	18.2
Incr Delay (d2), s/veh	1.2	0.0	0.0	1.7	0.1	0.0	4.2	0.8	0.8	1.1	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.1	3.5	0.7	0.3	1.7	9.2	9.4	2.3	10.4	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.2	0.0	31.4	34.7	30.2	29.8	41.3	20.3	20.5	36.6	19.0	19.0
LnGrp LOS	D	A	C	C	C	C	D	C	C	D	B	B
Approach Vol, veh/h		146			256			1390			1672	
Approach Delay, s/veh		35.0			33.6			21.7			21.5	
Approach LOS		D			C			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.6	39.7		13.5	9.1	42.3		15.7				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.6				
Max Green Setting (Gmax), s	6.0	74.4		35.0	16.0	74.4		37.4				
Max Q Clear Time (g_c+11), s	4	27.7		7.9	5.8	29.2		10.4				
Green Ext Time (p_c), s	0.3	5.9		0.4	0.1	8.5		0.4				

### Intersection Summary

HCM 6th Ctrl Delay	23.1
HCM 6th LOS	C













# HCM 6th Signalized Intersection Summary

## 7: Deer Valley Road & Davison Drive & Hillcrest Avenue

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	220	110	80	130	740	140	850	70	1060	1369	230
Future Volume (veh/h)	170	220	110	80	130	740	140	850	70	1060	1369	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	185	239	74	87	141	804	152	924	73	1152	1488	185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	209	758	229	108	421	1408	141	1089	86	772	1640	893
Arrive On Green	0.12	0.28	0.28	0.06	0.22	0.22	0.08	0.32	0.31	0.22	0.46	0.45
Sat Flow, veh/h	1795	2710	819	1795	1885	3195	1795	3362	266	3483	3582	1577
Grp Volume(v), veh/h	185	156	157	87	141	804	152	492	505	1152	1488	185
Grp Sat Flow(s),veh/h/ln	1795	1791	1738	1795	1885	1598	1795	1791	1836	1742	1791	1577
Q Serve(g_s), s	14.2	9.6	10.0	6.7	8.8	26.3	11.0	35.8	35.9	31.0	53.9	4.7
Cycle Q Clear(g_c), s	14.2	9.6	10.0	6.7	8.8	26.3	11.0	35.8	35.9	31.0	53.9	4.7
Prop In Lane	1.00		0.47	1.00		1.00	1.00		0.14	1.00		1.00
Lane Grp Cap(c), veh/h	209	501	486	108	421	1408	141	580	595	772	1640	893
V/C Ratio(X)	0.88	0.31	0.32	0.81	0.33	0.57	1.08	0.85	0.85	1.49	0.91	0.21
Avail Cap(c_a), veh/h	282	922	894	141	822	2087	141	640	656	772	1792	960
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.9	39.7	40.0	64.9	45.6	29.2	64.5	44.1	44.2	54.5	35.2	6.1
Incr Delay (d2), s/veh	17.9	0.1	0.1	17.0	0.2	0.1	97.8	8.8	8.6	228.6	6.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	4.2	4.2	3.5	4.1	9.8	8.8	16.8	17.2	38.1	24.6	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.8	39.9	40.1	81.9	45.8	29.4	162.2	52.9	52.8	283.0	41.6	6.2
LnGrp LOS	E	D	D	F	D	C	F	D	D	F	D	A
Approach Vol, veh/h	498			1032			1149			2825		
Approach Delay, s/veh	54.4			36.0			67.3			137.7		
Approach LOS	D			D			E			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	35.0	49.3	12.4	43.1	16.3	68.0	20.3	35.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.6	5.3	* 5.3	4.0	4.6				
Max Green Setting (Gmax), s	31.0	48.7	11.0	71.4	11.0	* 69	22.0	60.4				
Max Q Clear Time (g_c+1.0), s	33.0	37.9	8.7	12.0	13.0	55.9	16.2	28.3				
Green Ext Time (p_c), s	0.0	2.9	0.0	1.0	0.0	6.8	0.1	2.4				

### Intersection Summary

HCM 6th Ctrl Delay 96.4  
HCM 6th LOS F

### Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

The Ranch

8: Lone Tree Way & James Donlon Boulevard/Ridgerock Drive

Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	90	894	10	60	70	636	1036	20	80	1239	200
Future Volume (veh/h)	170	90	894	10	60	70	636	1036	20	80	1239	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	137	154	127	11	63	6	669	1091	10	84	1304	194
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	225	237	401	15	88	88	779	1972	858	108	1707	254
Arrive On Green	0.13	0.13	0.13	0.06	0.06	0.06	0.22	0.55	0.55	0.06	0.38	0.37
Sat Flow, veh/h	1795	1885	3195	278	1593	1598	3483	3582	1558	1795	4513	671
Grp Volume(v), veh/h	137	154	127	74	0	6	669	1091	10	84	991	507
Grp Sat Flow(s), veh/h/ln	1795	1885	1598	1871	0	1598	1742	1791	1558	1795	1716	1754
Q Serve(g_s), s	5.5	6.0	2.8	3.0	0.0	0.3	14.2	15.1	0.2	3.5	19.4	19.4
Cycle Q Clear(g_c), s	5.5	6.0	2.8	3.0	0.0	0.3	14.2	15.1	0.2	3.5	19.4	19.4
Prop In Lane	1.00		1.00	0.15		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	225	237	401	104	0	88	779	1972	858	108	1298	663
V/C Ratio(X)	0.61	0.65	0.32	0.71	0.00	0.07	0.86	0.55	0.01	0.77	0.76	0.76
Avail Cap(c_a), veh/h	514	540	915	950	0	811	1134	2518	1095	210	1697	867
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.8	32.0	30.6	35.7	0.0	34.4	28.7	11.2	7.8	35.6	20.9	21.0
Incr Delay (d2), s/veh	1.0	1.1	0.2	3.4	0.0	0.1	3.3	0.1	0.0	4.4	1.0	2.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	2.6	1.0	1.4	0.0	0.1	5.7	4.8	0.1	1.6	7.4	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.8	33.1	30.8	39.1	0.0	34.5	32.0	11.3	7.8	40.0	21.9	23.0
LnGrp LOS	C	C	C	D	A	C	C	B	A	D	C	C
Approach Vol, veh/h	418			80			1770			1582		
Approach Delay, s/veh	32.3			38.7			19.1			23.2		
Approach LOS	C			D			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	46.3		13.6	21.2	33.8		8.3				
Change Period (Y+Rc), s	4.0	5.3		4.9	4.0	* 5.3		4.0				
Max Green Setting (Gmax), s	9.0	52.7		21.1	25.0	* 37		39.0				
Max Q Clear Time (g_c+15), s	15.5	17.1		8.0	16.2	21.4		5.0				
Green Ext Time (p_c), s	0.0	5.3		0.8	1.0	6.9		0.2				

## Intersection Summary

HCM 6th Ctrl Delay 22.6

HCM 6th LOS C

## Notes

User approved volume balancing among the lanes for turning movement.













\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 9: Dallas Ranch Road/Eagleridge Drive & Lone Tree Way

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	1361	292	110	1092	50	210	60	80	50	40	90
Future Volume (veh/h)	110	1361	292	110	1092	50	210	60	80	50	40	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	120	1479	249	120	1187	21	228	65	-35	54	43	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	154	1765	777	166	1790	781	321	312	265	69	138	61
Arrive On Green	0.09	0.49	0.49	0.09	0.50	0.50	0.09	0.17	0.00	0.04	0.11	0.09
Sat Flow, veh/h	1795	3582	1578	1795	3582	1563	3483	1885	1598	1795	1235	546
Grp Volume(v), veh/h	120	1479	249	120	1187	21	228	65	-35	54	0	62
Grp Sat Flow(s),veh/h/ln	1795	1791	1578	1795	1791	1563	1742	1885	1598	1795	0	1781
Q Serve(g_s), s	5.0	27.1	7.2	4.9	18.8	0.5	4.8	2.3	0.0	2.3	0.0	2.4
Cycle Q Clear(g_c), s	5.0	27.1	7.2	4.9	18.8	0.5	4.8	2.3	0.0	2.3	0.0	2.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	154	1765	777	166	1790	781	321	312	265	69	0	199
V/C Ratio(X)	0.78	0.84	0.32	0.72	0.66	0.03	0.71	0.21	-0.13	0.79	0.00	0.31
Avail Cap(c_a), veh/h	402	2499	1101	402	2499	1091	642	1117	947	213	0	938
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.0	16.6	11.6	33.5	14.2	9.6	33.5	27.4	0.0	36.2	0.0	31.2
Incr Delay (d2), s/veh	3.2	1.3	0.1	2.2	0.2	0.0	1.1	0.1	0.0	7.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	9.3	2.1	2.1	6.3	0.1	1.9	1.0	0.0	1.1	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.3	17.9	11.7	35.7	14.4	9.6	34.6	27.5	0.0	43.4	0.0	31.5
LnGrp LOS	D	B	B	D	B	A	C	C	A	D	A	C
Approach Vol, veh/h	1848			1328			258			116		
Approach Delay, s/veh	18.3			16.2			37.5			37.0		
Approach LOS	B			B			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.9	16.6	11.0	41.4	11.0	12.5	10.5	42.0				
Change Period (Y+Rc), s	4.0	5.3	4.0	* 4.2	4.0	5.3	4.0	* 4.2				
Max Green Setting (Gmax), s	43.7	43.7	17.0	* 53	14.0	38.7	17.0	* 53				
Max Q Clear Time (g_c+14), s	4.3	4.3	6.9	29.1	6.8	4.4	7.0	20.8				
Green Ext Time (p_c), s	0.0	0.2	0.1	8.1	0.2	0.2	0.1	5.9				

### Intersection Summary

HCM 6th Ctrl Delay	19.6
HCM 6th LOS	B





























### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 6th Signalized Intersection Summary

## 10: Deer Valley Road & Lone Tree Way






























The Ranch  
Cumulative Plus Phase 2 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 		 	 	
Traffic Volume (veh/h)	100	890	540	275	900	270	426	479	277	380	395	40
Future Volume (veh/h)	100	890	540	275	900	270	426	479	277	380	395	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	109	967	310	299	978	102	463	521	241	413	429	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	134	1147	367	326	1924	200	402	623	287	459	936	78
Arrive On Green	0.07	0.30	0.30	0.18	0.40	0.40	0.11	0.26	0.25	0.13	0.28	0.27
Sat Flow, veh/h	1810	3860	1235	1810	4772	497	3510	2386	1099	3510	3370	282
Grp Volume(v), veh/h	109	866	411	299	708	372	463	394	368	413	229	236
Grp Sat Flow(s),veh/h/ln	1810	1729	1637	1810	1729	1811	1755	1805	1681	1755	1805	1847
Q Serve(g_s), s	7.3	28.7	28.8	19.9	18.8	18.9	14.0	25.2	25.4	14.2	12.8	13.0
Cycle Q Clear(g_c), s	7.3	28.7	28.8	19.9	18.8	18.9	14.0	25.2	25.4	14.2	12.8	13.0
Prop In Lane	1.00		0.75	1.00		0.27	1.00		0.65	1.00		0.15
Lane Grp Cap(c), veh/h	134	1028	486	326	1394	730	402	472	439	459	501	513
V/C Ratio(X)	0.81	0.84	0.84	0.92	0.51	0.51	1.15	0.83	0.84	0.90	0.46	0.46
Avail Cap(c_a), veh/h	163	1187	562	370	1583	829	402	605	563	459	635	649
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.8	40.3	40.3	49.3	27.4	27.4	54.2	42.7	43.2	52.4	36.5	36.7
Incr Delay (d2), s/veh	18.9	4.4	9.0	24.3	0.1	0.2	93.4	6.3	7.1	19.8	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	12.4	12.4	10.9	7.5	7.9	11.2	11.7	11.1	7.3	5.5	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.7	44.7	49.3	73.6	27.5	27.6	147.5	49.0	50.2	72.2	36.8	36.9
LnGrp LOS	E	D	D	E	C	C	F	D	D	E	D	D
Approach Vol, veh/h		1386			1379			1225			878	
Approach Delay, s/veh		48.5			37.5			86.6			53.5	
Approach LOS		D			D			F			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.0	36.0	26.0	40.3	18.0	38.0	13.0	53.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	16.0	39.7	25.0	40.7	14.0	41.7	11.0	54.7				
Max Q Clear Time (g_c+I1), s	16.2	27.4	21.9	30.8	16.0	15.0	9.3	20.9				
Green Ext Time (p_c), s	0.0	2.3	0.1	4.0	0.0	1.5	0.0	4.6				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			55.9									
HCM 6th LOS			E									

# HCM 6th Signalized Intersection Summary

## 11: Hillcrest Avenue & Lone Tree Way

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 		 	 	
Traffic Volume (veh/h)	336	1401	170	220	1200	320	270	419	320	510	351	145
Future Volume (veh/h)	336	1401	170	220	1200	320	270	419	320	510	351	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	365	1523	120	239	1304	143	293	455	233	554	382	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	287	1815	143	197	1660	508	227	588	299	440	918	401
Arrive On Green	0.16	0.37	0.37	0.11	0.32	0.32	0.13	0.26	0.25	0.13	0.26	0.26
Sat Flow, veh/h	1795	4863	383	1795	5147	1574	1795	2293	1165	3483	3582	1566
Grp Volume(v), veh/h	365	1074	569	239	1304	143	293	355	333	554	382	34
Grp Sat Flow(s),veh/h/ln	1795	1716	1815	1795	1716	1574	1795	1791	1667	1742	1791	1566
Q Serve(g_s), s	19.0	33.9	34.0	13.0	27.3	8.0	15.0	21.8	22.1	15.0	10.5	2.0
Cycle Q Clear(g_c), s	19.0	33.9	34.0	13.0	27.3	8.0	15.0	21.8	22.1	15.0	10.5	2.0
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.70	1.00		1.00
Lane Grp Cap(c), veh/h	287	1280	677	197	1660	508	227	459	427	440	918	401
V/C Ratio(X)	1.27	0.84	0.84	1.22	0.79	0.28	1.29	0.77	0.78	1.26	0.42	0.08
Avail Cap(c_a), veh/h	287	1618	856	197	2167	663	227	679	632	440	1357	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.9	34.0	34.0	52.9	36.5	30.0	51.9	40.9	41.5	51.9	36.8	33.6
Incr Delay (d2), s/veh	146.2	2.7	5.0	134.4	1.0	0.1	160.1	1.6	1.9	133.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.9	13.9	15.1	13.0	11.1	3.0	16.6	9.5	9.0	14.5	4.5	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	196.1	36.7	39.0	187.3	37.5	30.1	212.0	42.5	43.4	185.8	36.9	33.6
LnGrp LOS	F	D	D	F	D	C	F	D	D	F	D	C
Approach Vol, veh/h		2008			1686			981			970	
Approach Delay, s/veh		66.3			58.1			93.5			121.8	
Approach LOS		E			E			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.0	34.4	17.0	48.3	19.0	34.4	23.0	42.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	5.3	4.0	5.3	4.0	5.3				
Max Green Setting (Gmax), s	15.0	43.7	13.0	54.7	15.0	43.7	19.0	48.7				
Max Q Clear Time (g_c+I1), s	17.0	24.1	15.0	36.0	17.0	12.5	21.0	29.3				
Green Ext Time (p_c), s	0.0	2.4	0.0	7.0	0.0	1.5	0.0	6.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			78.1									
HCM 6th LOS			E									

# HCM 6th Signalized Intersection Summary

## 12: SR 4 Eastbound & Lone Tree Way

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	2607	1200	430	1922	0	0	0	0	880	10	850
Future Volume (veh/h)	0	2607	1200	430	1922	0	0	0	0	880	10	850
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	2744	942	453	2023	0				934	0	858
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2559	781	358	3631	0				893	0	397
Arrive On Green	0.00	0.49	0.49	0.18	0.70	0.00				0.25	0.00	0.25
Sat Flow, veh/h	0	5358	1582	1990	5358	0				3619	0	1610
Grp Volume(v), veh/h	0	2744	942	453	2023	0				934	0	858
Grp Sat Flow(s),veh/h/ln	0	1729	1582	995	1729	0				1810	0	1610
Q Serve(g_s), s	0.0	74.0	74.0	27.0	28.8	0.0				37.0	0.0	37.0
Cycle Q Clear(g_c), s	0.0	74.0	74.0	27.0	28.8	0.0				37.0	0.0	37.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2559	781	358	3631	0				893	0	397
V/C Ratio(X)	0.00	1.07	1.21	1.26	0.56	0.00				1.05	0.00	2.16
Avail Cap(c_a), veh/h	0	2559	781	358	3631	0				893	0	397
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	38.0	38.0	61.5	11.1	0.0				56.5	0.0	56.5
Incr Delay (d2), s/veh	0.0	40.9	105.0	139.5	0.1	0.0				42.9	0.0	530.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	39.2	49.8	13.6	9.9	0.0				21.8	0.0	73.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	78.9	143.0	201.0	11.2	0.0				99.4	0.0	586.9
LnGrp LOS	A	F	F	F	B	A				F	A	F
Approach Vol, veh/h		3686			2476						1792	
Approach Delay, s/veh		95.2			45.9						332.8	
Approach LOS		F			D						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	31.0	78.0		41.0		109.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	27.0	72.7		35.7		103.7						
Max Q Clear Time (g_c+29.0), s	29.0	76.0		39.0		30.8						
Green Ext Time (p_c), s	0.0	0.0		0.0		14.9						

### Intersection Summary

HCM 6th Ctrl Delay 133.4  
HCM 6th LOS F

### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary

## 13: SR 4 Westbound & Lone Tree Way

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑			
Traffic Volume (veh/h)	0	2787	700	210	1342	730	1010	50	420	0	0	0
Future Volume (veh/h)	0	2787	700	210	1342	730	1010	50	420	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No		No		No		No				
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	0	2934	549	221	1413	456	1101	0	305			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	1	1	1	1	1	1	1	1			
Cap, veh/h	0	2280	696	182	2992	903	1238	0	551			
Arrive On Green	0.00	0.44	0.44	0.10	0.58	0.58	0.34	0.00	0.34			
Sat Flow, veh/h	0	5316	1572	1795	5147	1553	3591	0	1598			
Grp Volume(v), veh/h	0	2934	549	221	1413	456	1101	0	305			
Grp Sat Flow(s),veh/h/ln	0	1716	1572	1795	1716	1553	1795	0	1598			
Q Serve(g_s), s	0.0	48.0	32.4	11.0	17.2	18.9	31.4	0.0	16.8			
Cycle Q Clear(g_c), s	0.0	48.0	32.4	11.0	17.2	18.9	31.4	0.0	16.8			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2280	696	182	2992	903	1238	0	551			
V/C Ratio(X)	0.00	1.29	0.79	1.21	0.47	0.51	0.89	0.00	0.55			
Avail Cap(c_a), veh/h	0	2280	696	182	2992	903	1624	0	723			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	30.2	25.8	48.7	13.1	13.4	33.5	0.0	28.8			
Incr Delay (d2), s/veh	0.0	132.5	5.6	135.4	0.0	0.2	4.4	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	46.0	12.2	11.6	5.9	5.9	13.6	0.0	6.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	162.7	31.4	184.1	13.1	13.6	37.9	0.0	29.1			
LnGrp LOS	A	F	C	F	B	B	D	A	C			
Approach Vol, veh/h		3483			2090			1406				
Approach Delay, s/veh		142.0			31.3			36.0				
Approach LOS		F			C			D				
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.0	52.0		41.3		67.0						
Change Period (Y+Rc), s	4.0	5.3		5.3		5.3						
Max Green Setting (Gmax), s	1.0	46.7		47.7		61.7						
Max Q Clear Time (g_c+11.3), s	1.0	50.0		33.4		20.9						
Green Ext Time (p_c), s	0.0	0.0		2.7		9.0						

### Intersection Summary

HCM 6th Ctrl Delay	87.5
HCM 6th LOS	F

### Notes

User approved volume balancing among the lanes for turning movement.











# HCM 6th Signalized Intersection Summary

The Ranch

14: Dallas Ranch Road & Prewett Ranch Drive/Prewett Ranch Road Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	160	0	10	50	170	10	70	20	462	420	170
Future Volume (veh/h)	110	160	0	10	50	170	10	70	20	462	420	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	120	174	0	11	54	75	11	76	2	502	457	151
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	194	254	0	154	80	112	154	426	11	571	932	306
Arrive On Green	0.11	0.13	0.00	0.09	0.11	0.11	0.09	0.12	0.09	0.32	0.35	0.32
Sat Flow, veh/h	1795	1885	0	1795	714	992	1795	3566	93	1795	2649	868
Grp Volume(v), veh/h	120	174	0	11	0	129	11	38	40	502	308	300
Grp Sat Flow(s),veh/h/ln	1795	1885	0	1795	0	1707	1795	1791	1868	1795	1791	1726
Q Serve(g_s), s	3.0	4.1	0.0	0.3	0.0	3.4	0.3	0.9	0.9	12.4	6.3	6.5
Cycle Q Clear(g_c), s	3.0	4.1	0.0	0.3	0.0	3.4	0.3	0.9	0.9	12.4	6.3	6.5
Prop In Lane	1.00		0.00	1.00		0.58	1.00		0.05	1.00		0.50
Lane Grp Cap(c), veh/h	194	254	0	154	0	192	154	214	223	571	630	607
V/C Ratio(X)	0.62	0.68	0.00	0.07	0.00	0.67	0.07	0.18	0.18	0.88	0.49	0.49
Avail Cap(c_a), veh/h	422	1451	0	422	0	1313	806	1953	2037	806	1953	1882
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	19.3	0.0	19.7	0.0	19.9	19.7	18.5	18.6	15.1	11.9	12.2
Incr Delay (d2), s/veh	1.2	1.2	0.0	0.1	0.0	1.5	0.1	0.1	0.1	6.3	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.6	0.0	0.1	0.0	1.2	0.1	0.3	0.3	4.7	1.8	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.1	20.5	0.0	19.8	0.0	21.5	19.8	18.7	18.7	21.4	12.1	12.4
LnGrp LOS	C	C	A	B	A	C	B	B	B	C	B	B
Approach Vol, veh/h	294			140			89			1110		
Approach Delay, s/veh	20.8			21.3			18.8			16.4		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	9.6	8.0	10.3	8.0	20.5	9.1	9.3				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	49.7	49.7	11.0	36.0	21.0	49.7	11.0	36.0				
Max Q Clear Time (g_c+I14.4	2.9	2.9	2.3	6.1	2.3	8.5	5.0	5.4				
Green Ext Time (p_c), s	0.5	0.2	0.0	0.5	0.0	2.2	0.1	0.4				

## Intersection Summary

HCM 6th Ctrl Delay	17.7
HCM 6th LOS	B











# HCM 6th Signalized Intersection Summary

## 15: Deer Valley Road & Prewett Ranch Drive

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour












Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	150	131	62	120	100	202	714	161	310	690	110
Future Volume (veh/h)	100	150	131	62	120	100	202	714	161	310	690	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	109	163	124	67	130	77	220	776	149	337	750	102
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	140	197	150	86	186	110	265	982	189	380	1240	169
Arrive On Green	0.08	0.20	0.20	0.05	0.17	0.17	0.15	0.33	0.31	0.21	0.39	0.37
Sat Flow, veh/h	1810	1001	762	1810	1118	662	1810	3021	580	1810	3193	434
Grp Volume(v), veh/h	109	0	287	67	0	207	220	464	461	337	424	428
Grp Sat Flow(s),veh/h/ln	1810	0	1763	1810	0	1781	1810	1805	1796	1810	1805	1822
Q Serve(g_s), s	4.3	0.0	11.3	2.7	0.0	7.9	8.6	16.9	16.9	13.1	13.6	13.7
Cycle Q Clear(g_c), s	4.3	0.0	11.3	2.7	0.0	7.9	8.6	16.9	16.9	13.1	13.6	13.7
Prop In Lane	1.00		0.43	1.00		0.37	1.00		0.32	1.00		0.24
Lane Grp Cap(c), veh/h	140	0	346	86	0	297	265	587	584	380	701	708
V/C Ratio(X)	0.78	0.00	0.83	0.77	0.00	0.70	0.83	0.79	0.79	0.89	0.60	0.61
Avail Cap(c_a), veh/h	275	0	900	250	0	885	474	996	991	425	947	955
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	0.0	27.9	34.1	0.0	28.5	30.0	22.2	22.4	27.8	17.7	17.9
Incr Delay (d2), s/veh	3.4	0.0	2.0	5.5	0.0	1.1	2.6	0.9	0.9	17.3	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	4.5	1.2	0.0	3.2	3.6	6.4	6.4	6.9	4.9	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.2	0.0	29.9	39.6	0.0	29.6	32.6	23.1	23.3	45.1	18.0	18.2
LnGrp LOS	D	A	C	D	A	C	C	C	C	D	B	B
Approach Vol, veh/h	396		274			1145			1189			
Approach Delay, s/veh	31.7		32.0			25.0			25.8			
Approach LOS	C		C			C			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	27.6	7.5	18.2	14.6	32.1	9.6	16.1				
Change Period (Y+Rc), s	4.0	5.3	4.0	4.0	4.0	5.3	4.0	4.0				
Max Green Setting (Gmax), s	7.0	38.7	10.0	37.0	19.0	36.7	11.0	36.0				
Max Q Clear Time (g_c+I15, s)	18.9	18.9	4.7	13.3	10.6	15.7	6.3	9.9				
Green Ext Time (p_c), s	0.1	3.3	0.0	1.0	0.2	3.0	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			26.8									
HCM 6th LOS			C									

# HCM 6th Signalized Intersection Summary

## 16: Deer Valley Road & Wellness Way

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	0	6	160	0	330	13	787	40	100	613	235
Future Volume (veh/h)	108	0	6	160	0	330	13	787	40	100	613	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1900	0	1900	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	117	0	7	174	0	57	14	855	17	109	666	255
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	0	0	0	2	0	0	0	0	0
Cap, veh/h	395	0	193	0	0	0	483	1497	653	142	1586	607
Arrive On Green	0.12	0.00	0.11	0.00	0.00	0.00	0.41	0.41	0.41	0.08	0.62	0.58
Sat Flow, veh/h	1346	0	1585		0		607	3610	1575	1810	2552	977
Grp Volume(v), veh/h	117	0	7		0.0		14	855	17	109	471	450
Grp Sat Flow(s),veh/h/ln	1346	0	1585				607	1805	1575	1810	1805	1724
Q Serve(g_s), s	2.6	0.0	0.1				0.4	5.7	0.2	1.8	4.2	4.4
Cycle Q Clear(g_c), s	2.6	0.0	0.1				0.4	5.7	0.2	1.8	4.2	4.4
Prop In Lane	1.00		1.00				1.00		1.00	1.00		0.57
Lane Grp Cap(c), veh/h	395	0	193				483	1497	653	142	1122	1072
V/C Ratio(X)	0.30	0.00	0.04				0.03	0.57	0.03	0.77	0.42	0.42
Avail Cap(c_a), veh/h	1031	0	941				1030	4751	2072	1917	4519	4317
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.2	0.0	12.3				5.5	7.0	5.4	14.1	3.0	3.2
Incr Delay (d2), s/veh	0.4	0.0	0.1				0.0	0.1	0.0	3.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0				0.0	0.9	0.0	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.6	0.0	12.4				5.5	7.1	5.4	17.4	3.1	3.3
LnGrp LOS	B	A	B				A	A	A	B	A	A
Approach Vol, veh/h	124						886			1030		
Approach Delay, s/veh	13.5						7.1			4.7		
Approach LOS	B						A			A		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	6.4	16.9	7.8		23.4							
Change Period (Y+Rc), s	4.0	5.3	4.5		5.3							
Max Green Setting (Gmax), s	33.0	39.7	18.0		76.7							
Max Q Clear Time (g_c+I), s	13.8	7.7	4.6		6.4							
Green Ext Time (p_c), s	0.1	3.9	0.3		3.7							

### Intersection Summary

HCM 6th Ctrl Delay	6.3
HCM 6th LOS	A

# HCM 6th Signalized Intersection Summary

## 17: Deer Valley Road & Sand Creek Road

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	109	24	130	230	416	40	597	80	370	356	47
Future Volume (veh/h)	91	109	24	130	230	416	40	597	80	370	356	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	96	115	25	137	242	121	42	628	77	389	375	49
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	321	440	373	406	546	264	67	999	122	588	1410	183
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.04	0.31	0.28	0.17	0.44	0.41
Sat Flow, veh/h	1035	1900	1610	1269	2359	1141	1810	3237	396	3510	3213	417
Grp Volume(v), veh/h	96	115	25	137	183	180	42	350	355	389	209	215
Grp Sat Flow(s), veh/h/ln	1035	1900	1610	1269	1805	1695	1810	1805	1829	1755	1805	1825
Q Serve(g_s), s	3.6	2.0	0.5	4.1	3.6	3.7	0.9	6.8	6.9	4.3	3.0	3.1
Cycle Q Clear(g_c), s	7.3	2.0	0.5	6.1	3.6	3.7	0.9	6.8	6.9	4.3	3.0	3.1
Prop In Lane	1.00		1.00	1.00		0.67	1.00		0.22	1.00		0.23
Lane Grp Cap(c), veh/h	321	440	373	406	418	392	67	557	564	588	792	801
V/C Ratio(X)	0.30	0.26	0.07	0.34	0.44	0.46	0.63	0.63	0.63	0.66	0.26	0.27
Avail Cap(c_a), veh/h	1898	3336	2827	2340	3169	2975	529	1849	1873	2054	2377	2403
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.7	12.9	12.3	15.4	13.5	13.5	19.5	12.2	12.3	16.0	7.3	7.4
Incr Delay (d2), s/veh	0.2	0.1	0.0	0.2	0.3	0.3	3.5	0.4	0.4	0.5	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.6	0.1	0.9	1.1	1.1	0.4	1.9	2.0	1.5	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.9	13.0	12.3	15.6	13.7	13.9	23.0	12.6	12.7	16.5	7.4	7.5
LnGrp LOS	B	B	B	B	B	B	C	B	B	B	A	A
Approach Vol, veh/h	236			500			747			813		
Approach Delay, s/veh	14.5			14.3			13.2			11.8		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.6			13.5	5.5	22.0		13.5				
Change Period (Y+Rc), s	4.0	5.3		4.0	4.0	5.3		4.0				
Max Green Setting (Gmax), s	40.7			72.0	12.0	52.7		72.0				
Max Q Clear Time (g_c+16.3), s	8.9			9.3	2.9	5.1		8.1				
Green Ext Time (p_c), s	0.7	2.5		0.6	0.0	1.7		1.4				

### Intersection Summary









HCM 6th Ctrl Delay	13.1
HCM 6th LOS	B

# HCM 6th Signalized Intersection Summary

## 18: Hillcrest Avenue & Sand Creek Road

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	188	697	100	280	686	190	80	140	210	120	170	149
Future Volume (veh/h)	188	697	100	280	686	190	80	140	210	120	170	149
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	198	734	89	295	722	158	84	147	88	126	179	63
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	870	105	292	880	192	103	748	423	120	915	311
Arrive On Green	0.13	0.27	0.27	0.16	0.30	0.30	0.06	0.34	0.34	0.07	0.35	0.35
Sat Flow, veh/h	1781	3191	387	1781	2899	634	1781	2188	1237	1781	2602	886
Grp Volume(v), veh/h	198	409	414	295	442	438	84	118	117	126	120	122
Grp Sat Flow(s),veh/h/ln	1781	1777	1801	1781	1777	1756	1781	1777	1648	1781	1777	1711
Q Serve(g_s), s	11.3	22.5	22.6	17.0	24.0	24.0	4.8	4.8	5.3	7.0	4.9	5.2
Cycle Q Clear(g_c), s	11.3	22.5	22.6	17.0	24.0	24.0	4.8	4.8	5.3	7.0	4.9	5.2
Prop In Lane	1.00		0.21	1.00		0.36	1.00		0.75	1.00		0.52
Lane Grp Cap(c), veh/h	237	485	491	292	539	533	103	608	563	120	625	602
V/C Ratio(X)	0.84	0.84	0.84	1.01	0.82	0.82	0.82	0.19	0.21	1.05	0.19	0.20
Avail Cap(c_a), veh/h	269	590	598	292	608	601	103	608	563	120	625	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	35.6	35.7	43.4	33.5	33.6	48.4	24.1	24.3	48.4	23.4	23.6
Incr Delay (d2), s/veh	18.1	9.1	9.1	55.6	8.0	8.1	37.9	0.7	0.8	95.9	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	10.5	10.6	11.7	10.9	10.9	3.2	2.1	2.1	6.2	2.1	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.0	44.8	44.8	99.0	41.5	41.7	86.2	24.8	25.2	144.3	24.1	24.4
LnGrp LOS	E	D	D	F	D	D	F	C	C	F	C	C
Approach Vol, veh/h	1021			1175			319			368		
Approach Delay, s/veh	48.1			56.0			41.1			65.3		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	1.0	39.5	21.0	32.3	10.0	40.5	17.8	35.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.5	35.0	16.5	34.0	5.5	36.0	15.2	35.0				
Max Q Clear Time (g_c+19.0), s	19.0	7.3	19.0	24.6	6.8	7.2	13.3	26.0				
Green Ext Time (p_c), s	0.0	1.2	0.0	3.2	0.0	1.3	0.1	3.4				

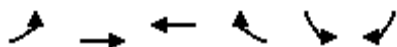
### Intersection Summary

HCM 6th Ctrl Delay	52.8
HCM 6th LOS	D

# HCM 6th Signalized Intersection Summary

## 19: Sand Creek Road & Heidorn Ranch Road

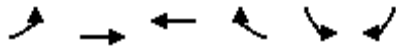
The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	80	944	1101	880	310	47
Future Volume (veh/h)	80	944	1101	880	310	47
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	994	1159	469	326	18
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	121	2117	1680	750	1018	467
Arrive On Green	0.07	0.60	0.47	0.47	0.29	0.29
Sat Flow, veh/h	1781	3647	3647	1585	3456	1585
Grp Volume(v), veh/h	84	994	1159	469	326	18
Grp Sat Flow(s), veh/h/ln	1781	1777	1777	1585	1728	1585
Q Serve(g_s), s	3.4	11.5	18.6	16.2	5.4	0.6
Cycle Q Clear(g_c), s	3.4	11.5	18.6	16.2	5.4	0.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	121	2117	1680	750	1018	467
V/C Ratio(X)	0.69	0.47	0.69	0.63	0.32	0.04
Avail Cap(c_a), veh/h	330	4408	3556	1586	1018	467
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.3	8.3	15.0	14.4	20.0	18.4
Incr Delay (d2), s/veh	6.9	0.2	0.5	0.9	0.8	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.6	3.2	6.2	4.9	2.0	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	40.2	8.4	15.6	15.3	20.9	18.5
LnGrp LOS	D	A	B	B	C	B
Approach Vol, veh/h		1078	1628		344	
Approach Delay, s/veh		10.9	15.5		20.7	
Approach LOS		B	B		C	
Timer - Assigned Phs			4	6	7	8
Phs Duration (G+Y+Rc), s			47.5	25.5	9.0	38.5
Change Period (Y+Rc), s			4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s			90.0	21.0	13.0	72.5
Max Q Clear Time (g_c+I1), s			13.5	7.4	5.4	20.6
Green Ext Time (p_c), s			8.1	1.0	0.1	13.4
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			14.5			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary 20: Sand Creek Road & State Route 4 (EB Ramps)

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour










Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	541	1019	930	280	1560	641
Future Volume (veh/h)	541	1019	930	280	1560	641
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	588	1108	1011	112	1696	483
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	440	3027	1129	504	1267	581
Arrive On Green	0.24	0.58	0.31	0.31	0.36	0.36
Sat Flow, veh/h	1810	5358	3705	1610	3510	1610
Grp Volume(v), veh/h	588	1108	1011	112	1696	483
Grp Sat Flow(s), veh/h/ln	1810	1729	1805	1610	1755	1610
Q Serve(g_s), s	35.0	16.3	38.5	7.4	52.0	39.4
Cycle Q Clear(g_c), s	35.0	16.3	38.5	7.4	52.0	39.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	440	3027	1129	504	1267	581
V/C Ratio(X)	1.34	0.37	0.90	0.22	1.34	0.83
Avail Cap(c_a), veh/h	440	3240	1278	570	1267	581
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.5	15.9	47.2	36.6	46.0	42.0
Incr Delay (d2), s/veh	166.7	0.0	7.3	0.1	157.7	9.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	65.9	6.2	17.9	2.9	49.6	16.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	221.2	15.9	54.5	36.6	203.8	51.4
LnGrp LOS	F	B	D	D	F	D
Approach Vol, veh/h		1696	1123		2179	
Approach Delay, s/veh		87.1	52.7		170.0	
Approach LOS		F	D		F	
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		88.1			39.0	49.1
Change Period (Y+Rc), s		5.3			4.5	5.3
Max Green Setting (Gmax), s		88.7			34.5	49.7
Max Q Clear Time (g_c+I1), s		18.3			37.0	40.5
Green Ext Time (p_c), s		5.4			0.0	3.3
					0.0	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			115.5			
HCM 6th LOS			F			

# HCM 6th Signalized Intersection Summary

## 21: State Route 4 (WB Ramps) & Sand Creek Road

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	783	1796	0	0	507	1120	703	0	410	0	0	0
Future Volume (veh/h)	783	1796	0	0	507	1120	703	0	410	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No		No				No					
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	824	1891	0	0	534	784	740	0	397			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	902	3276	0	0	635	1076	1041	0	463			
Arrive On Green	0.26	0.63	0.00	0.00	0.33	0.33	0.29	0.00	0.29			
Sat Flow, veh/h	3510	5358	0	0	1900	3220	3619	0	1610			
Grp Volume(v), veh/h	824	1891	0	0	534	784	740	0	397			
Grp Sat Flow(s),veh/h/ln	1755	1729	0	0	1900	1610	1810	0	1610			
Q Serve(g_s), s	22.6	20.9	0.0	0.0	25.8	21.2	18.1	0.0	23.1			
Cycle Q Clear(g_c), s	22.6	20.9	0.0	0.0	25.8	21.2	18.1	0.0	23.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	902	3276	0	0	635	1076	1041	0	463			
V/C Ratio(X)	0.91	0.58	0.00	0.00	0.84	0.73	0.71	0.00	0.86			
Avail Cap(c_a), veh/h	1028	5013	0	0	1203	2039	1692	0	753			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	35.7	10.6	0.0	0.0	30.5	29.0	31.6	0.0	33.4			
Incr Delay (d2), s/veh	10.5	0.1	0.0	0.0	1.2	0.4	0.3	0.0	2.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.4	6.5	0.0	0.0	11.2	7.7	7.5	0.0	0.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	10.6	0.0	0.0	31.7	29.4	31.9	0.0	36.3			
LnGrp LOS	D	B	A	A	C	C	C	A	D			
Approach Vol, veh/h	2715		1318			1137						
Approach Delay, s/veh	21.4		30.3			33.4						
Approach LOS	C		C			C						
Timer - Assigned Phs	2		4		5	6						
Phs Duration (G+Y+Rc), s	66.5		32.5		29.5	37.1						
Change Period (Y+Rc), s	5.3		5.3		4.0	5.3						
Max Green Setting (Gmax), s	94.4		45.0		29.0	61.4						
Max Q Clear Time (g_c+I1), s	22.9		25.1		24.6	27.8						
Green Ext Time (p_c), s	13.0		2.1		0.9	4.0						

### Intersection Summary




HCM 6th Ctrl Delay	26.3
HCM 6th LOS	C

### Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th TWSC  
22: Deer Valley Road & Balfour Road

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour

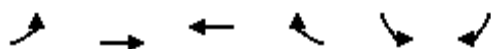
Intersection						
Int Delay, s/veh	129					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	617	120	120	433	107
Future Vol, veh/h	80	617	120	120	433	107
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	87	671	130	130	471	116
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1253	195	0	0	260	0
Stage 1	195	-	-	-	-	-
Stage 2	1058	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	192	851	-	-	1316	-
Stage 1	843	-	-	-	-	-
Stage 2	337	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	118	851	-	-	1316	-
Mov Cap-2 Maneuver	118	-	-	-	-	-
Stage 1	843	-	-	-	-	-
Stage 2	208	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	267.7	0	7.4			
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	497	1316	-	
HCM Lane V/C Ratio	-	-	1.524	0.358	-	
HCM Control Delay (s)	-	-	267.7	9.3	0	
HCM Lane LOS	-	-	F	A	A	
HCM 95th %tile Q(veh)	-	-	39.7	1.6	-	



# HCM 6th Signalized Intersection Summary

## 23: Balfour Road & SR-4 EB Ramps

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰↰	↱↱	↱↱	↰	↰	↰↰	
Traffic Volume (veh/h)	200	1655	1280	140	700	710	
Future Volume (veh/h)	200	1655	1280	140	700	710	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	217	1799	1391	0	761	768	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	290	1740	1318		785	1464	
Arrive On Green	0.08	0.49	0.37	0.00	0.44	0.44	
Sat Flow, veh/h	3456	3647	3647	1585	1781	2790	
Grp Volume(v), veh/h	217	1799	1391	0	761	768	
Grp Sat Flow(s),veh/h/ln	1728	1777	1777	1585	1781	1395	
Q Serve(g_s), s	7.1	56.3	42.7	0.0	48.0	20.8	
Cycle Q Clear(g_c), s	7.1	56.3	42.7	0.0	48.0	20.8	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	290	1740	1318		785	1464	
V/C Ratio(X)	0.75	1.03	1.06		0.97	0.52	
Avail Cap(c_a), veh/h	361	1740	1318		785	1464	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	51.5	29.3	36.2	0.0	31.4	17.9	
Incr Delay (d2), s/veh	4.8	30.9	40.8	0.0	24.5	0.2	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.2	29.2	24.8	0.0	25.2	18.1	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	56.2	60.3	76.9	0.0	55.9	18.1	
LnGrp LOS	E	F	F		E	B	
Approach Vol, veh/h							
		2016	1391	A	1529		
Approach Delay, s/veh							
		59.8	76.9		36.9		
Approach LOS							
		E	E		D		
Timer - Assigned Phs							
				4	6	7	8
Phs Duration (G+Y+Rc), s				60.3	54.7	13.6	46.7
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				55.8	50.2	11.5	39.8
Max Q Clear Time (g_c+I1), s				58.3	50.0	9.1	44.7
Green Ext Time (p_c), s				0.0	0.1	0.1	0.0
Intersection Summary							
HCM 6th Ctrl Delay			57.6				
HCM 6th LOS			E				

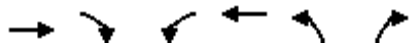
### Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary

## 24: SR-4 WB Ramps & Balfour Road

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour














Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	↑
Traffic Volume (veh/h)	1737	618	0	1720	330	80
Future Volume (veh/h)	1737	618	0	1720	330	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870
Adj Flow Rate, veh/h	1888	481	0	1870	359	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	0	2	2	2
Cap, veh/h	2270	1013	0	2270	1008	462
Arrive On Green	0.64	0.64	0.00	0.64	0.29	0.29
Sat Flow, veh/h	3647	1585	0	3741	3456	1585
Grp Volume(v), veh/h	1888	481	0	1870	359	59
Grp Sat Flow(s), veh/h/ln	1777	1585	0	1777	1728	1585
Q Serve(g_s), s	47.1	18.1	0.0	46.1	9.4	3.1
Cycle Q Clear(g_c), s	47.1	18.1	0.0	46.1	9.4	3.1
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2270	1013	0	2270	1008	462
V/C Ratio(X)	0.83	0.47	0.00	0.82	0.36	0.13
Avail Cap(c_a), veh/h	2565	1144	0	2565	1008	462
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	10.8	0.0	15.8	32.2	30.0
Incr Delay (d2), s/veh	2.2	0.3	0.0	2.1	1.0	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	8.1	6.1	0.0	16.4	4.1	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	18.2	11.1	0.0	17.9	33.2	30.5
LnGrp LOS	B	B	A	B	C	C
Approach Vol, veh/h	2369			1870	418	
Approach Delay, s/veh	16.8			17.9	32.8	
Approach LOS	B			B	C	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	37.5			77.5		77.5
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	23.5			82.5		82.5
Max Q Clear Time (g_c+I1), s	11.4			49.1		48.1
Green Ext Time (p_c), s	1.2			23.9		19.3
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			18.7			
HCM 6th LOS			B			

# HCM 6th Signalized Intersection Summary

## 25: Hillcrest Avenue & Prewett Ranch Drive

The Ranch  
Cumulative Plus Phase 2 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	40	200	20	30	10	20	518	20	20	609	162
Future Volume (veh/h)	191	40	200	20	30	10	20	518	20	20	609	162
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	203	43	213	21	32	11	21	551	21	21	648	172
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	241	428	363	68	176	60	68	1069	477	68	1069	477
Arrive On Green	0.14	0.23	0.23	0.04	0.13	0.12	0.04	0.30	0.30	0.04	0.30	0.30
Sat Flow, veh/h	1781	1870	1585	1781	1331	457	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	203	43	213	21	0	43	21	551	21	21	648	172
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1788	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.5	0.7	4.9	0.5	0.0	0.9	0.5	5.2	0.4	0.5	6.3	3.5
Cycle Q Clear(g_c), s	4.5	0.7	4.9	0.5	0.0	0.9	0.5	5.2	0.4	0.5	6.3	3.5
Prop In Lane	1.00		1.00	1.00		0.26	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	241	428	363	68	0	236	68	1069	477	68	1069	477
V/C Ratio(X)	0.84	0.10	0.59	0.31	0.00	0.18	0.31	0.52	0.04	0.31	0.61	0.36
Avail Cap(c_a), veh/h	241	851	721	241	0	814	241	1704	760	241	1704	760
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	12.4	14.0	19.0	0.0	15.8	19.0	11.8	10.1	19.0	12.1	11.1
Incr Delay (d2), s/veh	22.8	0.1	1.5	2.5	0.0	0.4	2.5	0.4	0.0	2.5	0.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.3	1.6	0.2	0.0	0.3	0.2	1.5	0.1	0.2	1.8	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.9	12.5	15.5	21.5	0.0	16.1	21.5	12.1	10.1	21.5	12.7	11.6
LnGrp LOS	D	B	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h	459			64			593			841		
Approach Delay, s/veh	26.0			17.9			12.4			12.7		
Approach LOS	C			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.6	16.2	5.6	13.3	5.6	16.2	9.5	9.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	19.0	19.0	5.0	18.0	5.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+12.5)	7.2	7.2	2.5	6.9	2.5	8.3	6.5	2.9				
Green Ext Time (p_c), s	0.0	2.6	0.0	0.7	0.0	3.4	0.0	0.1				

### Intersection Summary

HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B

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