APPENDIX F

CIRCULATION ASSESSMENT

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CIRCULATION ASSESSMENT

SOUTHERN LAS TRAMPAS LAND USE PLAN AMENDMENT

EAST BAY REGIONAL PARK DISTRICT, CALIFORNIA

This Circulation Assessment has been prepared under the supervision of
Ambarish Mukherjee, P.E.



LSA

February 2021

CIRCULATION ASSESSMENT

SOUTHERN LAS TRAMPAS LAND USE PLAN AMENDMENT

EAST BAY REGIONAL PARK DISTRICT, CALIFORNIA

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LIST OF ABBREVIATIONS AND ACRONYMS

ADT	average daily trips
BART	Bay Area Rapid Transit
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CCTA	Contra Costa County Transportation Authority
CEQA	California Environmental Quality Act
Chang project	Chang Property Development
CMP	Congestion Management Program
CO_2e	carbon dioxide equivalent
County	County of Contra Costa
Faria project	Faria Preserve Community Project
GHG	greenhouse gas
GPS	global positioning system
HCM	Highway Capacity Manual
HDM	Caltrans *Highway Design Manual*
I-680	Interstate 680
ICU	Intersection Capacity Utilization
IMBA	International Mountain Biking Association
ITE	Institute of Transportation Engineers
LOS	level of service
LUPA	Land Use Plan Amendment
mph	mile(s) per hour
MT	metric ton(s)
NCUAQMD	North Coast Unified Air Quality Management District
OPR	Governor's Office of Planning and Research
Park District	East Bay Regional Park District
Preserve	Las Trampas Wilderness Regional Preserve
project	Las Trampas Wilderness Regional Preserve Land Use Plan Amendment
RTP	Regional Transportation Plan

SCAQMD	South Coast Air Quality Management District
TA	OPR Technical Advisory
TIA	Traffic Impact Analysis
TIMS	Transportation Injury Mapping System
VMT	vehicle miles traveled

INTRODUCTION

Statement of Purpose

This Circulation Assessment has been prepared to identify the effects and impacts, if any, that may result from the implementation of the Southern Las Trampas Wilderness Regional Preserve (preserve) Land Use Plan Amendment (LUPA) (project) on vehicular, bicyclist, and pedestrian access and safety. The project's trip generation potential was developed based on existing preserve usage and planned improvements. Designs were reviewed for safety considerations and recommendations are provided where appropriate.

Project Description

Project Goals and Objectives

The LUPA would serve as an amendment to the 1993 Las Trampas Land Use Development Plan. The main purposes of the LUPA are the following:

- Evaluate 756 acres of open space for natural resource protection, public use for passive recreation, and interpretation.
- Evaluate and incorporate appropriate trail connections, including the alignments, appropriate trail use, access and parking, and routine maintenance requirements.
- Provide recommendations for one new staging area off Bollinger Canyon Road on the Chen property that would meet East Bay Regional Park District (Park District) objectives for a staging area.
- Preserve the rich heritage of natural and cultural resource and provide open space, trails, and safe and healthful recreation and environmental education.

The LUPA would be consistent with the Park District's guiding policy document, the 2013 Master Plan[1], which provides for the preparation of land use plans to direct the long-term development and management of individual parks, identify major facility development, and establish appropriate land use designations in accordance with the Park District's vision.

The LUPA would serve as a supplement to the Las Trampas Regional Wilderness Land Use Development Plan (LUDP) adopted in November 1993 and the Las Trampas Regional Wilderness Resource Analysis adopted in August 1991. The Resource Analysis described and analyzed important natural and manmade resources in the parklands and identified resource and land planning issues for the LUDP. The LUDP provided policies and implementation measures for the preserve, Little Hills Regional Recreation Area, and the western end of the Las Trampas to Mount Diablo Regional Trail. The Peters Ranch parcel acquired prior to the 1993 LUDP was briefly mentioned in the LUDP as the southern non-contiguous parcel.

[1] East Bay Regional Park District, 2013. *2013 Master Plan*. July 16.

Project Background

The project area is known for its steep topography and diverse natural resources. The steep and rugged hills with their many side ridges and valleys create a complex habitat for native species and provide a challenging experience for park visitors. The geographical center of the project area is Las Trampas Ridge, which rises 700 feet above Bollinger Canyon Road. In addition to the rugged topography, the project area includes numerous rock outcrops.

The project area consists of existing open Las Trampas parkland along with five parcels: Peters Ranch, Chen, Elworthy, Podva, and Faria. The Peters Ranch property encompasses a 58.84-acre area within unincorporated Contra Costa County and borders Danville to the north and to the east of the property, and San Ramon to the south of the property. Park District staff can access the property from Fountain Springs Drive off San Ramon Valley Boulevard.

The Chen property encompasses a 228-acre area within unincorporated Contra Costa County, bordering Danville to the northeast of the property, and is within the City of San Ramon's sphere of influence. Park District staff access the property from Bollinger Canyon Road, which makes up the southern border of the property, and from Las Trampas Regional Wilderness to the north through the Calaveras Ridge Trail. A staging area along the frontage of Bollinger Canyon Road would provide public access to this property.

The Elworthy property encompasses a 232-acre area within unincorporated Contra Costa County and Danville. Park District staff and park users can access the property from Elworthy Ranch Road off San Ramon Valley Boulevard. At the terminus of Elworthy Ranch Road, an existing staging area and trail connector to the Calaveras Ridge Trail provide access to the parkland property through an easement across private property.

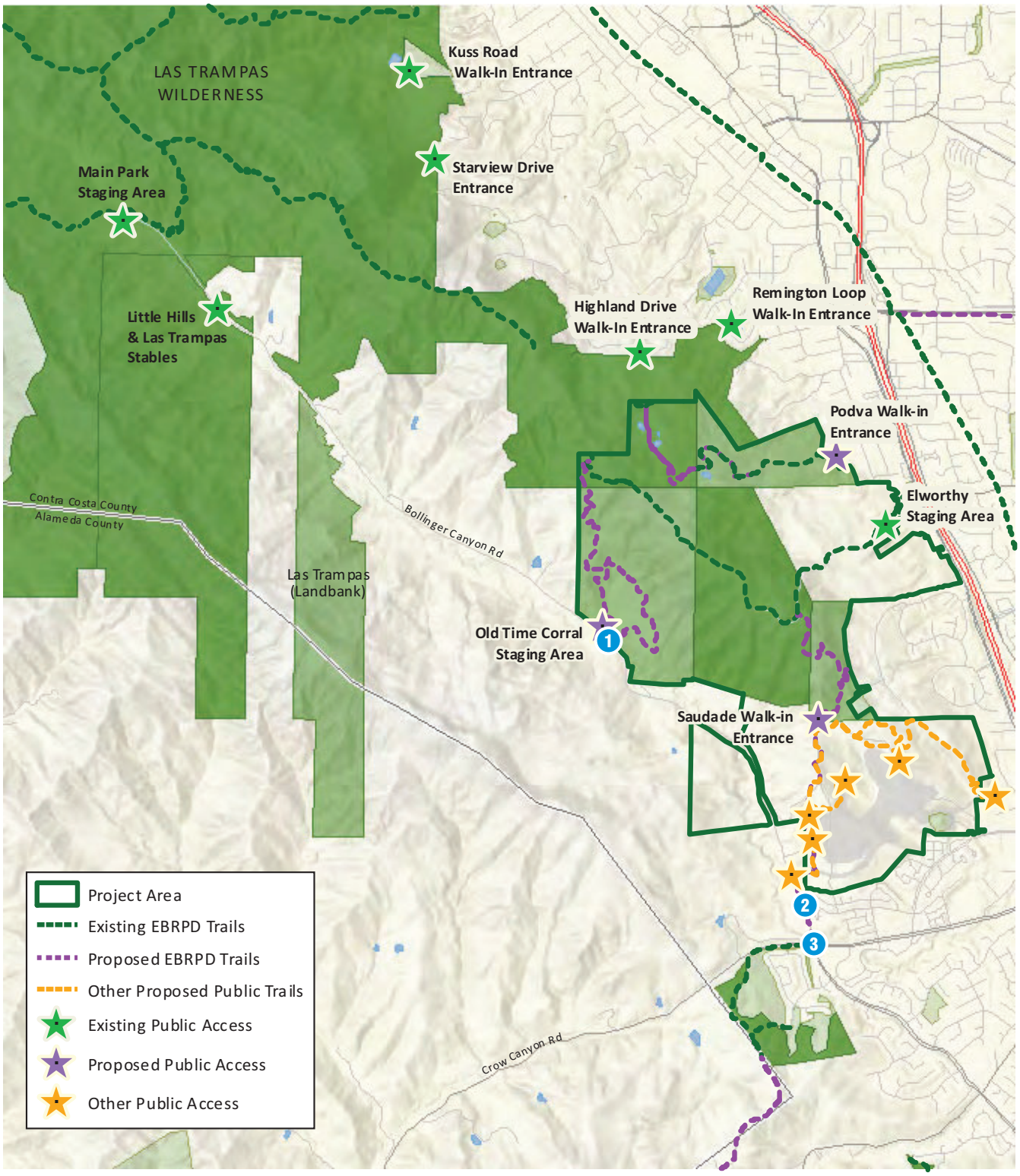
The Podva property encompasses a 96-acre area within Danville. Las Trampas is to the west of the property. The property includes an access point and trail with public on-street parking from Wingfield Court and Midland Way, off San Ramon Valley Boulevard.

The Faria property encompasses a 141-acre area within unincorporated Contra Costa County. The property borders San Ramon to the southeast. Bollinger Canyon Road splits the Faria property and runs from the northwest to southeast. This property will remain in land bank status until future acquisitions and/or regional trail connections to Park District property in San Ramon can be made.

A project overview map is included in Figure 1.

Proposed Project

The project proposes to open to the public 1.7 miles of narrow (single-track) trails and 2.5 miles of emergency vehicle and maintenance access roads for a total of 4.2 miles of new trails. New trail construction would involve the use of mechanized equipment, such as a mini-excavator and manual labor using hand tools.



LSA

LEGEND

- Study Area Intersections

FIGURE 1

N

0 1500 3000

FEET

SOURCE: East Bay Regional Park District (2018)

I:\EBR1702\G\Location.cdr (7/10/2020)

Southern Las Trampas LUPA
Circulation Assessment

Project Location

The proposed project would divide the project area into natural and recreation/staging units, as defined by the District's 2013 Master Plan. The proposed project would designate the vast majority of the project area as a natural unit in which the land would remain undeveloped with the exception of recreational trails. Public infrastructure would be concentrated in the remaining land comprising of one staging area and two small trailhead lots. Proposed project elements would include the following actions:

- Designate and develop a staging area off Bollinger Canyon Road on the Chen property to serve as the southern gateway to Las Trampas, with all-weather parking to accommodate up to 25 vehicles, benches, a restroom, trail connections, information signs, and landscaping.

- Provide public access into Las Trampas from a walk-in entrance on Podva property off Wingfield Court and Midland Way.

- Provide public access into Las Trampas from a walk-in entrance on Peters Ranch property from the City of San Ramon trail system on the Geological Hazard Abatement District open space lands around the Preserve (formerly Faria Preserve) subdivision.

- Close and restore 0.6 mile of an existing over steep and eroded ranch road within the Chen property.

- Designate and develop one 1.1-mile access road on the Chen property to allow pedestrian, bicycle, equestrian and maintenance and emergency vehicle access into Las Trampas from existing roads and trails and connect to Bollinger Canyon Road. Approximately 0.1 miles of the new access road would incorporate an existing natural surface, multi-use trail alignment.

- Designate and develop one 0.8-mile loop trail on the Chen property from the proposed staging area, to be further evaluated in a future planning project.

- Identify an area for a potential trail connecting the proposed 1.1-mile access road to the Las Trampas Ridge line, to be further evaluated in a future planning project.

- Develop one 0.9-mile natural surface, multi-use trail segment of the Calaveras Ridge Regional Trail (Calaveras Ridge Trail) on the Peters Ranch property, connecting future City of San Ramon public trails on an adjacent property to existing trails on the Elworthy property. Approximately 0.1 mile of the new trail would incorporate an existing natural surface, multi-use trail alignment.

- Close and restore 0.4 mile of an existing trail alignment within the Peters Ranch property.

- Designate a 0.9-mile access road as a natural surface, multi-use trail to allow pedestrian, bicycle, and equestrian and maintenance and emergency vehicle access into Las Trampas from the Podva property.

- Provide seeps, ponds, and wetland restoration and enhancements within the Chen property and Las Trampas open parkland.

- Designate a 0.5-mile access road as a natural surface, multi-use trail to allow pedestrian, bicycle, and equestrian and maintenance and emergency vehicle access into Las Trampas from the Podva property.

- Designate 99 percent of the project area as a natural unit, with less than 1 percent as a recreation/staging unit.

- Designate a 35-acre area through a wetland complex as a Special Resource Protection Area.

- Designate 201 acres as Special Protection Features, including a wetland complex area and areas encumbered with a conservation easement.

Summary of Findings

This Circulation Assessment found that the implementation of the project is not anticipated to result in any significant transportation or safety impacts.

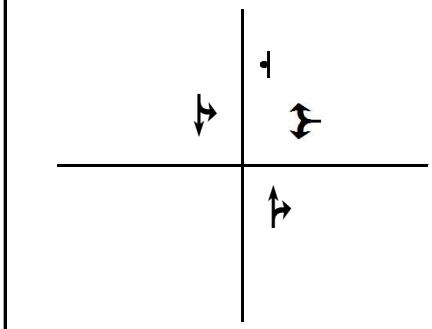
METHODOLOGY

Data Collection

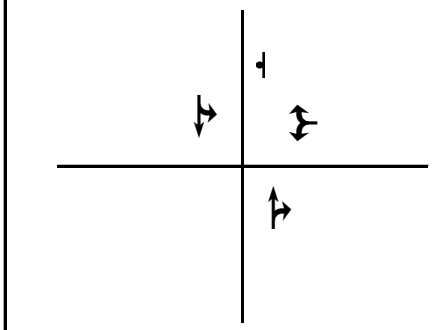
The analysis of all modes of travel is based on vehicular, bicycle, and pedestrian data collected along Bollinger Canyon Road north of Crow Canyon Road. Existing vehicular, bicycle, and pedestrian demand was assessed against the ability of existing roadway facilities to accommodate all users. As conflict points occur almost exclusively at roadway intersections, three intersections along Bollinger Canyon Road were chosen as locations where conflicts between the various types of users would occur. Figure 2 shows the geometrics of these study area intersections.

As this analysis seeks to assess vehicular, bicyclist, and pedestrian access and safety, the data collection effort focused on the peak usage period of Bollinger Canyon Road and the surrounding preserve. For the purposes of traffic engineering analysis, 1 hour serves as the measure of a peak usage period.

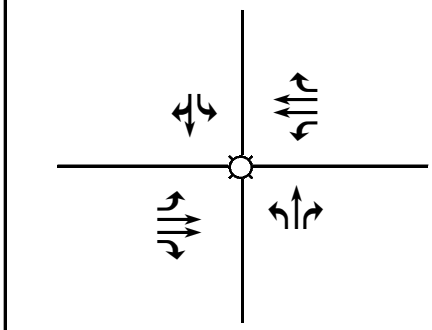
The peak usage period and the subsequent peak hour were identified through on-site observations and coordination with the Park District staff and empirical traffic data collection during the initial circulation assessment period. The weekend is recognized as the peak park activity period. Park District and LSA staff identified a peak usage period of Friday through Sunday, capturing the busiest recreational visitation days of the week. To identify the busiest peak hour within this time frame, a 24-hour road segment count was collected along Bollinger Canyon Road just north of Deerwood Drive from Friday, September 22, 2017, to Sunday, September 24, 2017. The 4-hour period with the highest number of automobiles counted was identified for a more detailed traffic count that was conducted on Saturday, October 7, 2017, between 11:00 a.m. and 3:00 p.m. The peak hour used for analysis was found to be from 11:30 a.m. to 12:30 p.m. Count data have been included in Appendix A and illustrated on Figure 3.



1 Bollinger Cyn Rd/Old Time Corral Staging Area



2 Bollinger Cyn Rd / Deerwood Dr



3 Bollinger Cyn Rd / Crow Cyn Rd

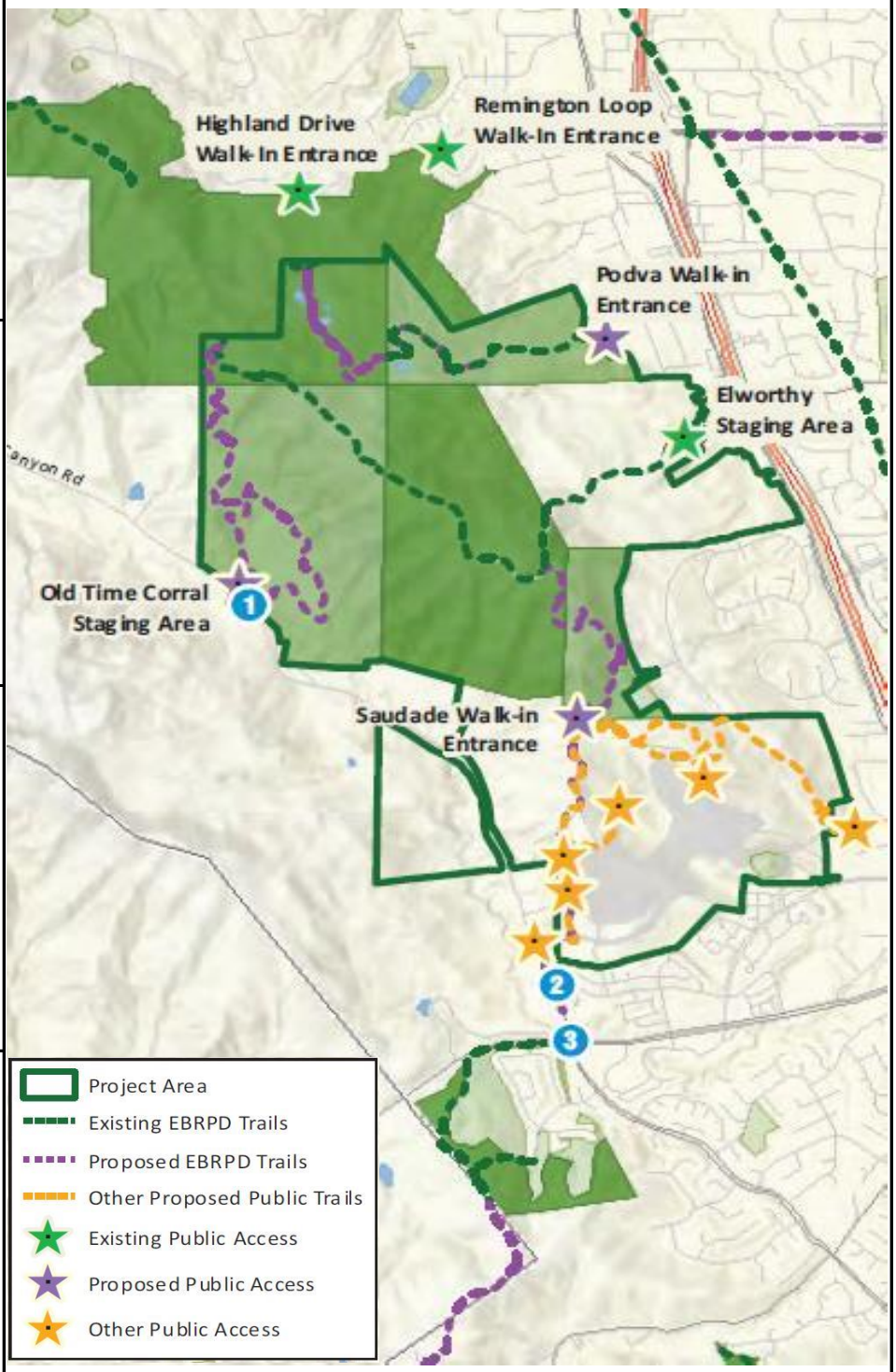


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FIGURE 2

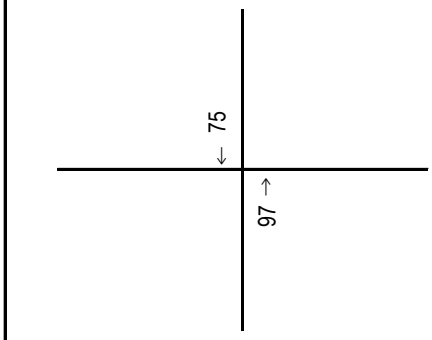
Legend

Signal

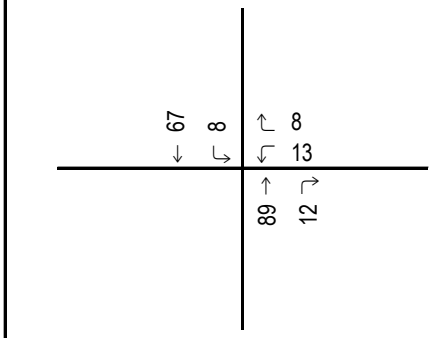
Stop Sign

Southern Las Trampas LUPA Circulation Assessment

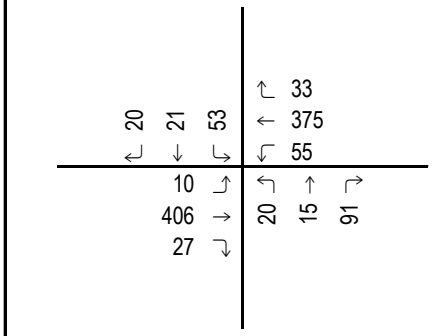
Existing Roadway Geometrics



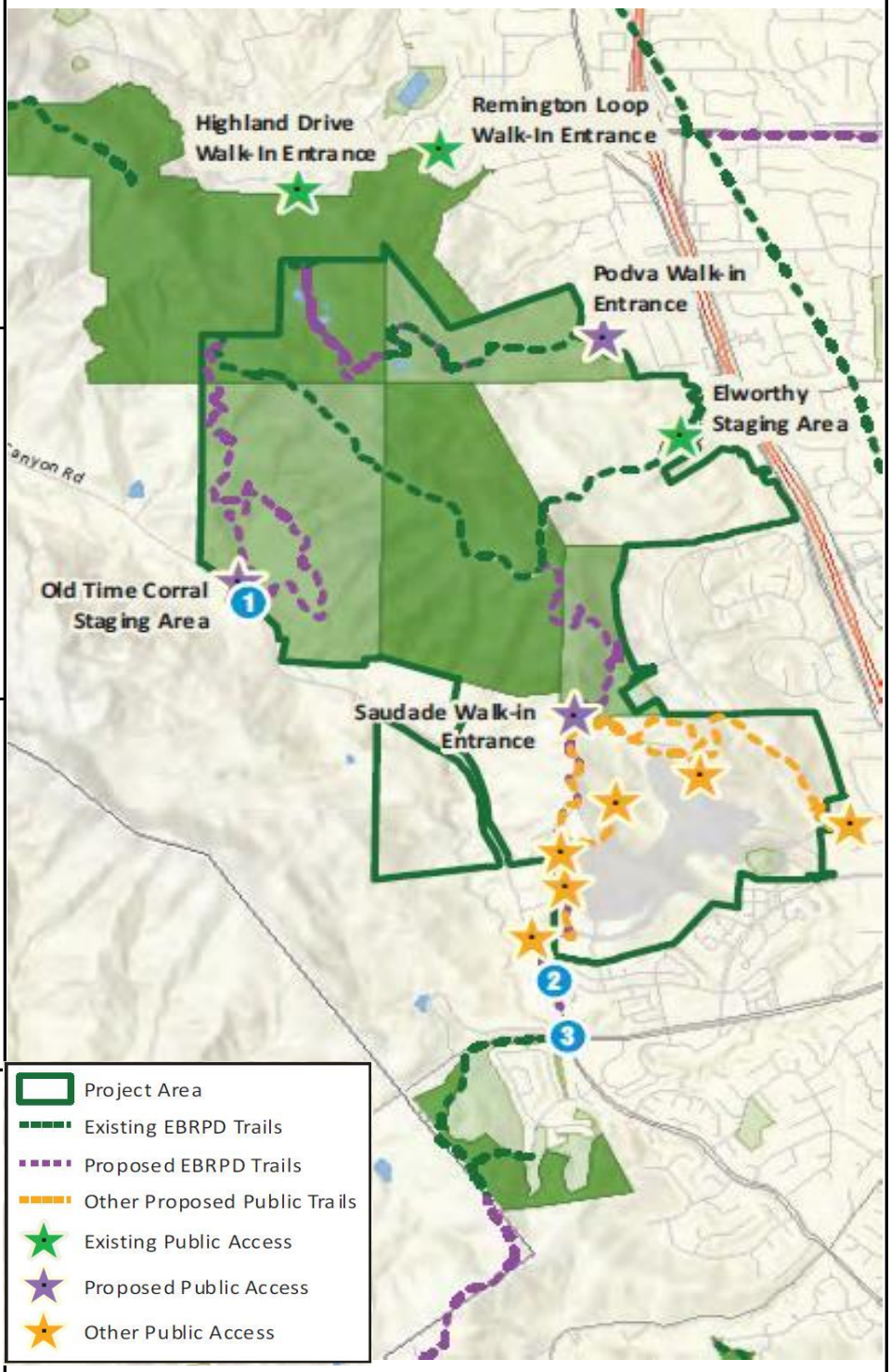
1 Bollinger Cyn Rd/Old Time Corral Staging Area



2 Bollinger Cyn Rd / Deerwood Dr



3 Bollinger Cyn Rd / Crow Cyn Rd



LSA

FIGURE 3

xx Saturday Peak–Hour Volume

Southern Las Trampas LUPA Circulation Assessment

Existing (2020 Condition) Volumes

In addition to empirical analysis data, LSA staff visited the preserve on Sunday, November 5, 2017, to confirm existing roadway conditions and to interview on-site Park District staff members about their observations of visitor behavior, traffic, and safety. These observations were reconfirmed in discussions with Park District staff in 2020.

SENATE BILL 743 VEHICLE MILES TRAVELED ANALYSIS

California Senate Bill 743 (SB 743) was signed in 2013 and required a move away from vehicle delay and level of service (LOS) within California Environmental Quality Act (CEQA) transportation analysis. This bill required the Governor's Office of Planning and Research (OPR) to identify new metrics for identifying and mitigating transportation impacts. OPR identified vehicle miles traveled (VMT) per capita and VMT per employee as the new metrics for transportation analysis. The goal of this bill is to bring State transportation analysis in line with promoting State goals of reducing greenhouse gas emissions through the reduction of VMT.

According to the revised *State CEQA Guidelines* codified in Section 15064.3(a), project-related transportation impacts are generally best measured by evaluating the project's VMT. VMT refers to the amount and distance of automobile travel attributable to a project.

To determine whether a project has a significant transportation impact under CEQA, the traffic analysis must determine whether the project would conflict or be inconsistent with *State CEQA Guidelines* Section 15064.3 subdivision (b). Specifically related to land use projects, Section 15064.3(b) of the California Code of Regulations states the following:

> Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. The *Contra Costa County Transportation Analysis Guidelines*[1] provides guidance on analyzing transportation impacts according to the revised CEQA guidelines. The guidelines establish screening criteria based on substantial evidence that can be applied to projects anticipated to have a less than significant impact. According to the Contra Costa County Transportation Authority (CCTA) guidelines, the following projects are expected to have a less than significant impact with regards to VMT:
>
> - Projects that generate or attract fewer than 110 daily vehicle trips; or,
> - Projects of 10,000 square feet or less of non-residential space or 20 residential units or less, or otherwise generating less than 836 VMT per day.
> - Residential, retail, office projects, or mixed-use projects proposed within ½ mile of an existing major transit stop or an existing stop along a high quality transit corridor.

[1] Contra Costa County Public Works Department. 2020. Contra Costa County Transportation Analysis Guidelines. June 23.

- Residential projects (home-based VMT) at 15% or below the baseline County-wide home-based average VMT per capita, or employment projects (employee VMT) at 15% or below the baseline Bay Area average commute VMT per employee in areas with low VMT that incorporate similar VMT reducing features (i.e., density, mix of uses, transit accessibility).

- Public facilities (e.g. emergency services, passive parks (low-intensity recreation, open space), libraries, community centers, public utilities) and government buildings.

Passive parks are the parks that do not have sports fields or facilities, such as a rink or court where youths and adults play in organized leagues. The project is a park with no sport fields or sport facilities and therefore can be classified as a passive park. In addition, because the proposed project is an expansion of the existing passive park (i.e., additional trail mileage, acreage, and parking spaces), it would not significantly increase vehicle trips on a typical weekday or during the weekend peak (as described later in the Trip Generation section of this Circulation Assessment). As such, the project is expected to have a less than significant impact with regards to VMT.

Furthermore, the OPR Technical Advisory (TA) acknowledges that certain activities and projects may result in a reduction in VMT and greenhouse gas (GHG) emissions and, therefore, a less than significant impact to transportation and circulation. These may be size, location, proximity to transit, or trip-making potential. For example, a project that generates a low volume of daily traffic may be presumed to create a less than significant impact.

The TA would recommend a volume of 110 average daily trips (ADT) as the screening criteria for a VMT analysis and the presumption of a less than significant impact. However, this recommendation is not based on any analysis of GHG reduction. It is instead based on the potential trip generation of an office project that would be categorically exempt under CEQA. LSA prepared a deeper analysis and used the California Emissions Estimator Model (CalEEMod) to correlate the effect of changes in project-related ADT to the resulting GHG emissions. This model was selected because it is provided by the California Air Resources Board to be used statewide for developing project-level GHG emissions. CalEEMod was used with the built-in default trip lengths and types to show the vehicular GHG emissions from incremental amounts of ADT. Table A shows the resulting annual VMT and GHG emissions from the incremental ADT.

Table A: Representative VMT and GHG Emissions from CalEEMod

Average Daily Trips (ADT)	Annual Vehicle Miles Traveled (VMT)	GHG Emissions (Metric Tons CO_2e per year)
200	683,430	258
300	1,021,812	386
400	1,386,416	514
500	1.703,020	643
600	2,043,623	771

Source: CalEEMod version 2016.3.2. Example project used: 50 single-family homes in Orange County.
CalEEMod = California Emissions Estimator Model
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas

The North Coast Unified Air Quality Management District (NCUAQMD) has not defined a GHG emissions threshold. However, the South Coast Air Quality Management District (SCAQMD) defines the GHG emissions threshold as 3,000 metric tons (MT) of carbon dioxide equivalent[1] (CO_2e) per year. The vehicle emissions are typically more than 50 percent of the total project GHG emissions. Thus, a project with 500 ADT would generally have total project emissions that could be less than 1,300 MT CO_2e/year (i.e., 50 percent or 643 MT CO_2e/year coming from vehicle emissions and the other 50 percent coming from other project activities). As this level of GHG emissions would be less than 3,000 MT CO_2e/year, the emissions of GHG from a project up to 500 ADT would typically be less than significant.

The proposed project is anticipated to generate 311 ADT on a Saturday (based on the additional parking spaces, as described later in this study). The weekend is acknowledged as the peak period of park activities. The proposed project is expected to generate fewer than 500 ADT on a typical weekday, as many park patrons are at work or school. Therefore, the proposed project is presumed to have a less than significant transportation impact.

ANALYSIS TECHNIQUES

Vehicular Mobility – Intersection Level of Service

While CEQA no longer requires an LOS analysis for the purpose of determining a project's transportation impacts, LOS analyses are useful in evaluating a project's operational and safety impacts. Evaluation of intersections along Bollinger Canyon Road used methodologies consistent with City of San Ramon, Town of Danville, and CCTA traffic analysis guidelines.

Evaluation of the signalized intersection of Bollinger Canyon Road and Crow Canyon Road within San Ramon uses the City of San Ramon's prescribed Intersection Capacity Utilization (ICU) peak-hour intersection capacity methodology. This methodology is a capacity-based methodology that derives a capacity utilization ratio from demand inputs in the form of vehicular peak-hour volumes and capacity inputs from intersection controls and geometrics. The Traffix software package has been used to analyze ICU based vehicular peak-hour LOS at the intersection of Bollinger Canyon Road and Crow Canyon Road.

LOS is a qualitative assessment of the quantitative effects of such factors as traffic volume, roadway geometrics, speed, delay, and maneuverability on roadway and intersection operations where LOS A represents free-flow activity and LOS F represents overcapacity operation.

Evaluation of vehicular operations at unsignalized intersections along Bollinger Canyon Road will use the CCTA-prescribed 2010 Highway Capacity Manual (HCM) peak-hour intersection operations methodology. This methodology is a delay-based analysis methodology that relies on inputs such as

[1] Carbon dioxide equivalent (CO_2e) is a concept developed to provide one metric that includes the effects of numerous greenhouse gases (GHGs). The global warming potential (GWP) of each GHG characterizes the ability of each GHG to trap heat in the atmosphere relative to another GHG. The GWPs of all GHGs are combined to derive the CO_2e.

intersection controls and geometrics and vehicular peak-hour volumes and ultimately produces an LOS grade. Peak-hour intersection operations were assessed at the following locations:

1. Bollinger Canyon Road/Old Time Corral Staging Area
2. Bollinger Canyon Road/Deerwood Drive
3. Bollinger Canyon Road/Crow Canyon Road

The Synchro 10 software package has been used to analyze vehicular peak-hour LOS at unsignalized locations. Synchro 10 is a widely recognized and accepted macroscopic traffic analysis software that supports 2010 HCM methodology. The following table shows the relationship between LOS, ICU value (i.e., volume-to-capacity ratio), and delay.

LOS	Signalized Intersection Capacity Utilization (ICU)	Unsignalized Intersection Delay (seconds)
A	≤ 0.60	≤10.0
B	0.61–0.70	>10.0 and ≤15.0
C	0.71–0.80	>15.0 and ≤25.0
D	0.81–0.90	>25.0 and ≤35.0
E	0.91–1.00	>35.0 and ≤50.0
F	> 1.00	>50.0

LOS = level of service

THRESHOLDS AND CRITERIA

Vehicular peak-hour analysis criteria for each study area facility depend on the jurisdiction where they are located. All study locations are within areas under the jurisdiction of the City of San Ramon and Town of Danville's General Plans; both consider LOS D to be the limit of acceptability. The CCTA Congestion Management Program (CMP) considers LOS E to be the limit of acceptability for CMP facilities.

The intersection of Bollinger Canyon Road/Old Time Corral Staging Area is in an unincorporated portion of Contra Costa County. This study uses LOS C as the limit of acceptability at this location, consistent with the County's General Plan – Growth Management Element. LOS D is used as the limit of acceptability at the remaining study intersections in keeping with the standards of the City of San Ramon and the Town of Danville.

EXISTING SETTING

Access

The preserve and the adjacent parcels can be accessed from major freeways such as Interstate 680 (I-680) to the east and Interstate 580 to the south. Bollinger Canyon Road is the only local access route to the preserve. Bollinger Canyon Road can be reached via Crow Canyon Road via a signalized intersection.

Bollinger Canyon Road is a major arterial that runs through San Ramon and varies from two to six lanes. In the vicinity of the preserve, the segment of Bollinger Canyon Road north of Crow Canyon Road is a two-lane rural collector and serves as a route for bicyclists to travel to and from the

Bollinger Canyon Staging Area. The Bollinger Canyon Staging area is 4.5 miles north of Crow Canyon Road.

Vehicle Parking

The existing Bollinger Canyon Staging Area at the northern terminus of Bollinger Canyon Road provides 45 parking spaces. Other all-weather gravel staging areas along Bollinger Canyon Road that provide parking for trail users include the Elderberry Trailhead, Bollinger Canyon Road Equestrian Parking, and the Chamise Trailhead. The equestrian parking area is a gated, all-weather gravel lot that can accommodate equestrian trailers and can be used as overflow passenger vehicle parking during special events. The Chamise Trailhead provides an all-weather gravel area that can accommodate up to 7 passenger vehicles. A gated all-weather gravel lot next to the Chamise Trailhead that previously served as a construction staging area for the Bollinger Canyon Staging Area currently serves as an overflow lot that Park District staff can make available during busy days and can accommodate approximately 70 passenger vehicles. The Elderberry Trailhead provides space for approximately 30 passenger vehicles.

LSA staff interviewed Park District staff on usage patterns and found that passenger vehicles also park along both sides of Bollinger Canyon Road from the Bollinger Canyon Road Staging Area entrance south for approximately 500 feet. Although this segment, along with various other segments all along Bollinger Canyon Road, is available for on-street parking the remote nature, limited trail access, and availability of overflow parking areas for special events make it unreasonable to consider parking along the road farther south than this segment. According to Park District staff observations, on-street parked visitors rarely reach south past the preserve gate near the Elderberry Trailhead.

With the exception of the Elderberry Trailhead staging area, all preserve trailheads along Bollinger Canyon Road are currently behind a gate that restricts use of these areas to hours coinciding with roughly dawn until dusk, depending on the time of year.

Transit

San Ramon has bus transportation via the CCTA's County Connection service. County Connection Route 35 has bus stops at the corner of Bollinger Canyon Road and Crow Canyon Road. Route 35 runs every hour from 6:00 a.m. to 9:00 p.m., Monday through Friday, and connects the San Ramon Transit Center to the West Dublin/Pleasanton Bay Area Rapid Transit (BART) station.

The closest BART station is the West Dublin/ Pleasanton station in Dublin near the intersection of Dublin Boulevard and Golden Gate Drive, approximately 7 miles south of the preserve via I-680.

Bicycle and Pedestrian Facilities

Bicycle and pedestrian facilities, such as class II bike lanes, class III bike route designations, and sidewalks do not exist along Bollinger Canyon Road in the vicinity of the preserve. Class II bicycle facilities are provided on both sides of Bollinger Canyon Road between Crow Canyon Road and north of Deerwood Drive. According to publicly available global positioning system (GPS) based qualitative data from Strava.com and the 24-hour traffic counts collected, recreational cyclists use Bollinger

Canyon Road to reach the Bollinger Canyon Staging Area. The shoulders of Bollinger Canyon Road are unpaved and do not provide continuous pedestrian connectivity. Pedestrian users of the preserve, such as hikers and dog walkers, arrive at the preserve primarily via passenger car. According to the CCTA Bicycle and Pedestrian Plan, class II bicycle facilities are proposed along Bollinger Canyon Road north of Deerwood Drive to connect cyclists to the Old Time Corral Staging Area and the Bollinger Canyon Staging Area. The proposed project will accommodate the right-of-way for a future class II bicycle facility along Bollinger Canyon Road.

Existing Intersection Level of Service Analysis

The Saturday peak-hour counts (11:30 a.m. to 12:30 p.m.) were assessed against the existing vehicular roadway facilities to determine current vehicular operational levels. Traffic counts collected in 2017–2018 were escalated to account for the passage of 3 years. As existing traffic conditions are atypical due to the ongoing COVID-19 pandemic, new traffic counts could not be collected and used to reflect typical existing conditions. Therefore, a 1.5 percent growth factor per year was applied to the 2017 traffic counts to account for possible growth and to represent a 2020 condition. Peak-hour intersection operations at study area intersections are based on ICU methodology at signalized intersections and HCM 2010 methodology at unsignalized intersections. As shown in Table B, the two existing study intersections currently operate at acceptable LOS A.

Table B: Existing Intersection Level of Service Summary

Intersection	Existing Weekend Peak Hour	
	ICU/Delay	LOS
1. Bollinger Canyon Road/Old Time Corral Staging Area[1]	--	--
2. Bollinger Canyon Road/Deerwood Drive[1]	9.5 sec	A
3. Bollinger Canyon Road/Crow Canyon Road	0.244	A

Source: Compiled by LSA (2020).
[1] Unsignalized intersection
ICU = intersection capacity utilization
LOS = level of service
sec = seconds
-- = location does not exist under this scenario

Appendix B includes all intersection LOS worksheets.

Existing Plus Future Projects Baseline Conditions

To forecast future traffic conditions along Bollinger Canyon Road upon project completion, nearby traffic generating developments have been identified and included in an existing plus future projects baseline.

Park District staff provided information on the following nearby projects: (1) Faria Preserve Community Project (Faria project) and (2) Chang Property Development (Chang project).

The Faria project is within the San Ramon city limit, west of I-680 and south of the Danville town limit. The Faria project would access the regional roadway network through Bollinger Canyon Road and Deerwood Road. The Faria project includes 740 residential units, a 1.5-acre house of worship site, a 2.6-acre educational facility site, a 12.9-acre community park, and a 0.7-acre rose garden. This

project is currently under construction and is anticipated to contribute traffic to the study area. To include traffic from the Faria project in this analysis, assumptions about the Faria project's trip generation potential were obtained from the Traffic Impact Analysis (TIA) and adjusted for Saturday peak-hour conditions.[1] This was achieved by applying current industry standard Saturday peak-hour trip generation rates against the Faria project's land uses.[2] Table C provides a Saturday trip generation summary table.

Table C: Faria Project Saturday Trip Generation

Land Use (Land Use Code)	Size	Units	ADT	Saturday Peak Hour		
				In	Out	Total
Trip Rates[1]						
Single Family Detached Residential (210)		DU	9.54	0.50	0.43	0.93
Multifamily Housing (Low-Rise) (220)		DU	8.14	0.35	0.35	0.70
Senior Adult Housing (Attached) (252)		DU	3.23	0.20	0.13	0.33
Church (560)		TSF	5.99	1.64	1.14	2.78
Daycare Center (565)		Student	0.39	0.07	0.04	0.11
Public Park (411)		AC	1.96	0.15	0.13	0.28
Museum (580)		TSF	--	0.47	0.19	0.66
Faria Project Trip Generation						
Single-Family Detached Homes	256	DU	2442	129	110	238
Townhomes/Apartments	398	DU	3240	139	139	279
Senior Attached Residential	86	DU	278	18	11	28
Church	15.000	TSF	90	25	17	42
Daycare	120	Student	47	8	5	13
Community Park	13.2	AC	26	2	2	4
Educational Facility	25.000	TSF	0	12	5	17
		Total	**6,122**	**332**	**288**	**620**

Sources: AECOM. 2013. *Faria Preserve Final Transportation Impact Analysis*; Institute of Transportation Engineers. 2017. *Trip Generation Manual*.

[1] Trip rates obtained from *Trip Generation Manual* 10th Edition, 2017

ADT = average daily trips DU = dwelling units

AC = acres TSF = thousand square feet

The Chang project site is at the northwest corner of Bollinger Canyon Road/Crow Canyon Road, within the San Ramon city limit. The Chang project would access the regional roadway network through Bollinger Canyon Road. The Chang project includes 43 single-family, large-lot homes and 18 accessory dwelling units. LSA estimated the trip generation of the project for Saturday peak-hour conditions. This was achieved by applying current industry standard Saturday peak-hour trip generation rates against the Chang project's land uses.[2] Table D provides a Saturday trip generation summary table for the Chang project.

1 AECOM. 2013. *Faria Preserve Final Transportation Impact Analysis.*

2 Institute of Transportation Engineers, 2017. *Trip Generation,* 10th Edition.

Table D: Chang Project Saturday Trip Generation

Land Use	Size	Unit	Saturday			
				Peak Hour		
			ADT	In	Out	Total
Trip Rates[1]						
Single Family Detached Housing (210)		DU	9.54	0.50	0.43	0.93
Project Trip Generation						
Single Family Detached Homes	43	DU	410	22	18	40
Accessory Dwelling Units	18	DU	172	9	8	17
Total Trip Generation			**582**	**31**	**26**	**57**

[1] Trip rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th Edition (2017).
ADT = average daily trips
DU = dwelling units

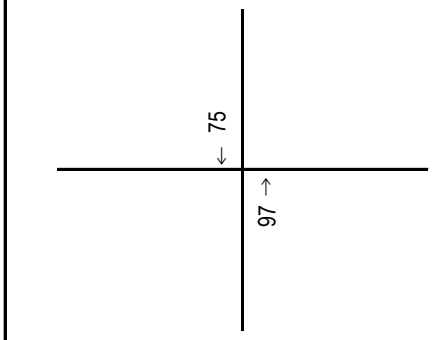
The resulting Saturday Faria project and Chang project peak-hour trips were distributed throughout the study area according to the same trip distribution pattern used for weekday trips in the Faria TIA, and added to existing Saturday traffic counts to arrive at an existing plus future projects baseline. Figure 4 shows the resulting volumes. These volumes were then used to assess existing plus future projects peak-hour vehicular operations at the three study intersections.

As shown on Table E, the two existing study intersections are anticipated to operate at LOS B or better during the weekend peak hour after the inclusion of traffic from the Faria project and Chang project. Appendix B includes all intersection LOS worksheets.

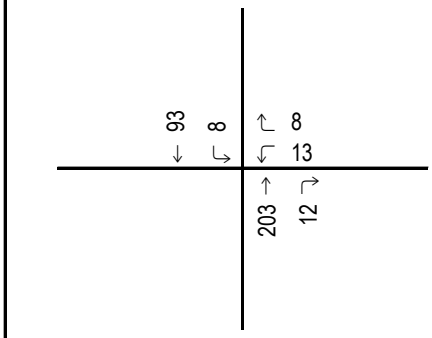
Table E: Existing Plus Future Projects Intersection Level of Service Summary

Intersection	Existing + Future Projects Weekend Peak Hour	
	ICU/Delay	LOS
1. Bollinger Canyon Road/Old Time Corral Staging Area[1]	--	--
2. Bollinger Canyon Road/Deerwood Drive[1]	10.5 sec	B
3. Bollinger Canyon Road/Crow Canyon Road	0.265	A

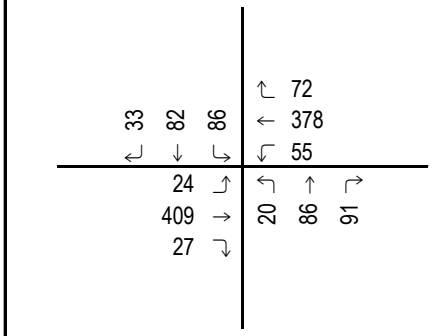
Source: Compiled by LSA (2020).
[1] Unsignalized intersection
ICU = intersection capacity utilization
LOS = level of service
sec = seconds
-- = location does not exist under this scenario



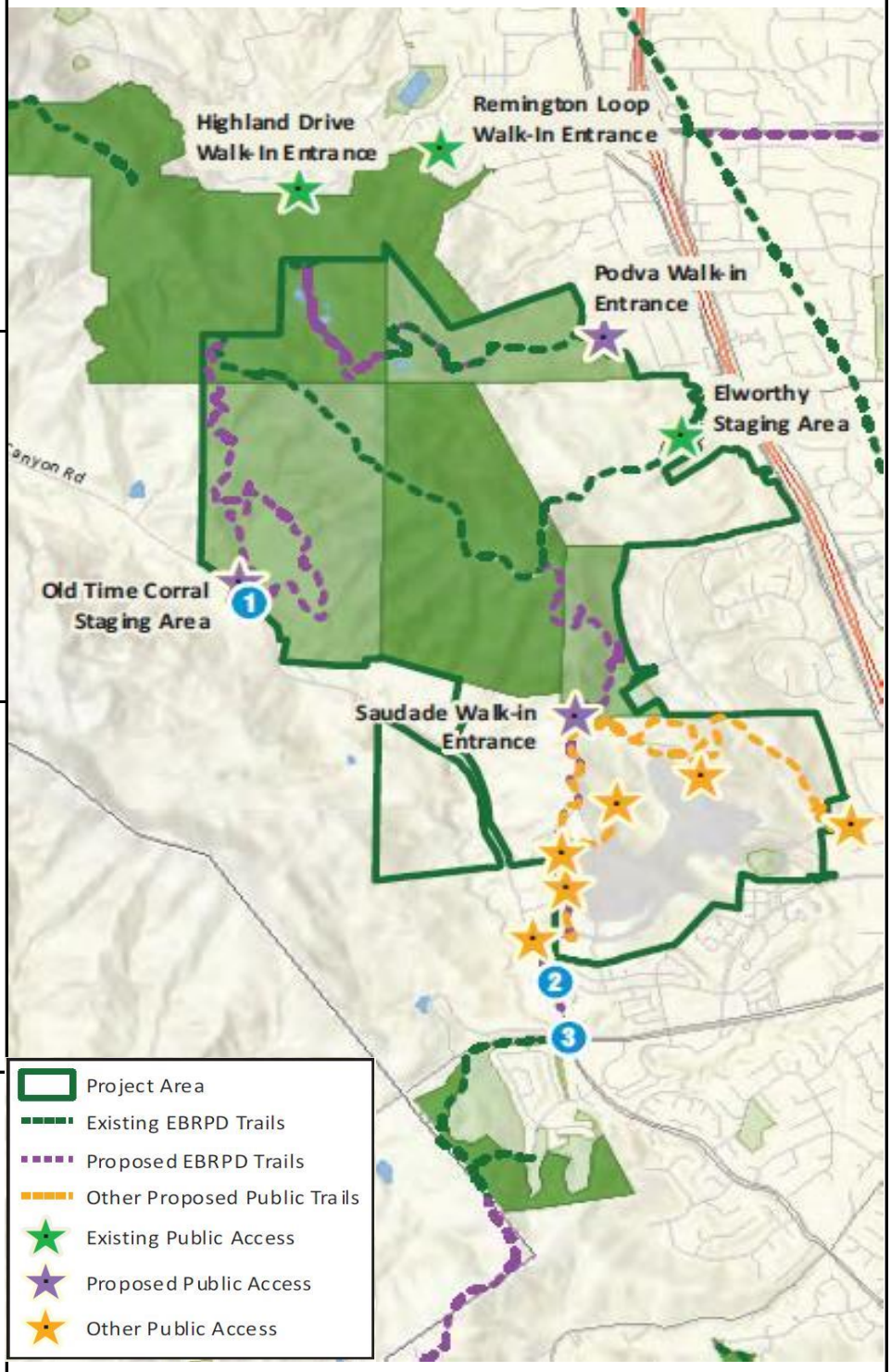
1 Bollinger Cyn Rd/Old Time Corral Staging Area



2 Bollinger Cyn Rd / Deerwood Dr



3 Bollinger Cyn Rd / Crow Cyn Rd



LSA

FIGURE 4

xx Saturday Peak–Hour Volume

Southern Las Trampas LUPA Circulation Assessment
Existing plus Future Projects Volumes

PROJECT IMPACTS

This section details the process by which project traffic was forecasted and its resulting effects on vehicular mobility on Bollinger Canyon Road.

Trip Generation

The weekend daily and peak-hour trips for the project were generated using the data collected along Bollinger Canyon Road, north of Deerwood Drive. Although nationally used trip generation rates such as those published by the Institute of Transportation Engineers (ITE) may be applicable for nationally comparable uses such as a typical single-family household, church, or small community park, nationally surveyed rates were not used to forecast project traffic. These rates were not used to forecast project traffic because large recreational parks often wildly differ from each other in popularity, level of usage, and general interest due to characteristics that are specific to each individual large park environment and level of amenity.

To forecast new project trips from existing data, quantifiable changes such as trail mileage, acreage, and parking spaces resulting from the project were considered against existing preserve trip generation. Existing weekend peak-hour preserve traffic was counted as 165 (93 inbound and 72 outbound) trips during the peak hour from 11:30 a.m. to 12:30 p.m. on Saturday, October 7, 2017. This existing trip number includes congregate care, residential, and commercial uses along Bollinger Canyon Road north of Deerwood Drive. The commercial uses and the congregate care were open and occupied when the counts were conducted, and therefore the counts provide a conservative estimate of the preserve's existing Saturday peak-hour traffic generation. The use of this traffic count as an estimate of preserve traffic is considered applicable because information provided by Park District staff regarding Saturday activity at the non-preserve uses along Bollinger Canyon Road such as The Ranch at Little Hills event center, the Corrie Companies, the Las Trampas Stables, the Child Day School preschool, and Brookdale senior living facility would have generated nominal vehicular traffic during the data collection period.

Based on existing preserve trail mileage, acreage, and parking spaces, trip generation rates were developed for each park unit type, as shown in Table F.

Table F: Southern Las Trampas Preserve Saturday Trip Generation Rates

Unit Type	Units	ADT	Saturday Peak Hour		
			In	Out	Total
Existing Trail Mileage	29.92	39.44	3.11	2.41	5.52
Existing Total Acreage	4,116	0.29	0.02	0.02	0.04
Existing Parking Spaces[1]	95	12.42	0.98	0.76	1.74
Existing Las Trampas Preserve Trips		1,180	93	72	165

Source: Compiled by LSA (2017).
Note: Existing trail mileage, total acreage, and number of parking spaces were based on the existing Las Trampas Regional Wilderness Trail Map, the Las Trampas LUPA project description, and an LSA staff field visit, respectively.
[1] Parking supply total includes the stalls of the Bollinger Canyon Staging Area, the Elderberry Trailhead, Chamise Trailhead, and the 500-foot-long roadside parking area on Bollinger Canyon Road adjacent to the Bollinger Canyon Staging Area.
ADT = average daily trips
LUPA = Land Use Plan Amendment

The project's trip generation potential, based on its associated increases to mileage, acreage, and parking spaces, were developed and shown below in Table G.

Table G: Las Trampas LUPA Trip Generation Potential

Unit Type	Units	ADT	Saturday Peak Hour		
			In	Out	Total
Additional Las Trampas LUPA Trail Mileage	6.1	241	19	15	34
Additional Las Trampas LUPA Acreage	756	217	17	13	30
Additional Parking Spaces (Old Time Corral Staging Area)	25	311	24	19	43

Source: Compiled by LSA (2020).
ADT = average daily trips
LUPA = Land Use Plan Amendment

As shown in Table G, the proposed project is forecast to generate 241 ADT on a Saturday, including 34 peak-hour trips (19 inbound and 15 outbound), based on 6.1 additional trail miles. The project would generate 217 ADT on a Saturday, including 30 peak-hour trips (17 inbound and 13 outbound), based on 756 additional acres. The project is forecast to generate 311 ADT on a Saturday, including 43 peak-hour trips (24 inbound and 19 outbound), based on 25 additional parking spaces. In an effort to provide a worst-case, most-conservative analysis, the vehicular operations analysis used the highest trip generation potential of the project, which, in this case, is based on additional parking spaces.

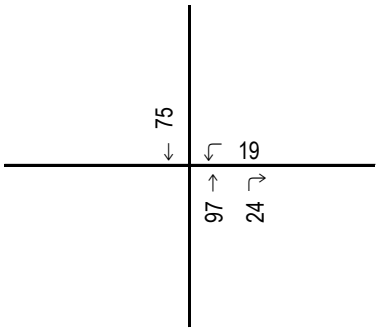
It should be emphasized that this Circulation Assessment focuses on the Saturday peak hour, as parks and recreational uses are forecast to generate higher trips on weekends. LSA reviewed the weekday and weekend trip rates for Land Use Code 411 (Public Park) contained in the ITE *Trip Generation Manual,* 10th Edition (2017). It was determined that the weekday daily and peak-hour trip rates are less than half of the Saturday daily and peak-hour trip rates, respectively. More specifically, the weekday daily trips are approximately 42 percent of the weekend daily trips, and the weekday peak-hour trips are approximately 45 percent of the weekend peak-hour trips. Applying these weekday percentages to the anticipated project weekend trips could result in a project weekday trip generation of 131 daily trips and 19 peak-hour trips. Because of the low estimated weekday trip generation, the proposed project is not anticipated to exacerbate or create any operational or safety deficiencies or impacts on a weekday. Therefore, evaluation of Saturday conditions is appropriate for this Circulation Assessment.

Trip Distribution

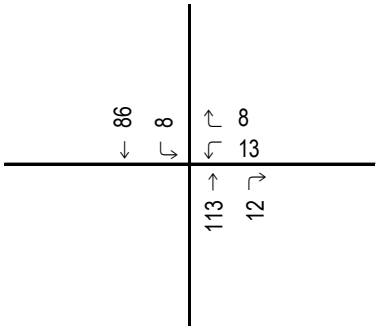
Project trips were distributed based on existing travel patterns and the location of the proposed parking facilities.

Existing and Existing Plus Future Projects with Project Conditions

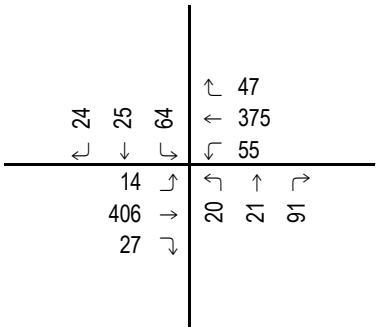
New project trips were then added to existing and existing plus future project baseline conditions to determine the project's potential impact on vehicular operations. Figures 5 and 6 show the resulting volumes.



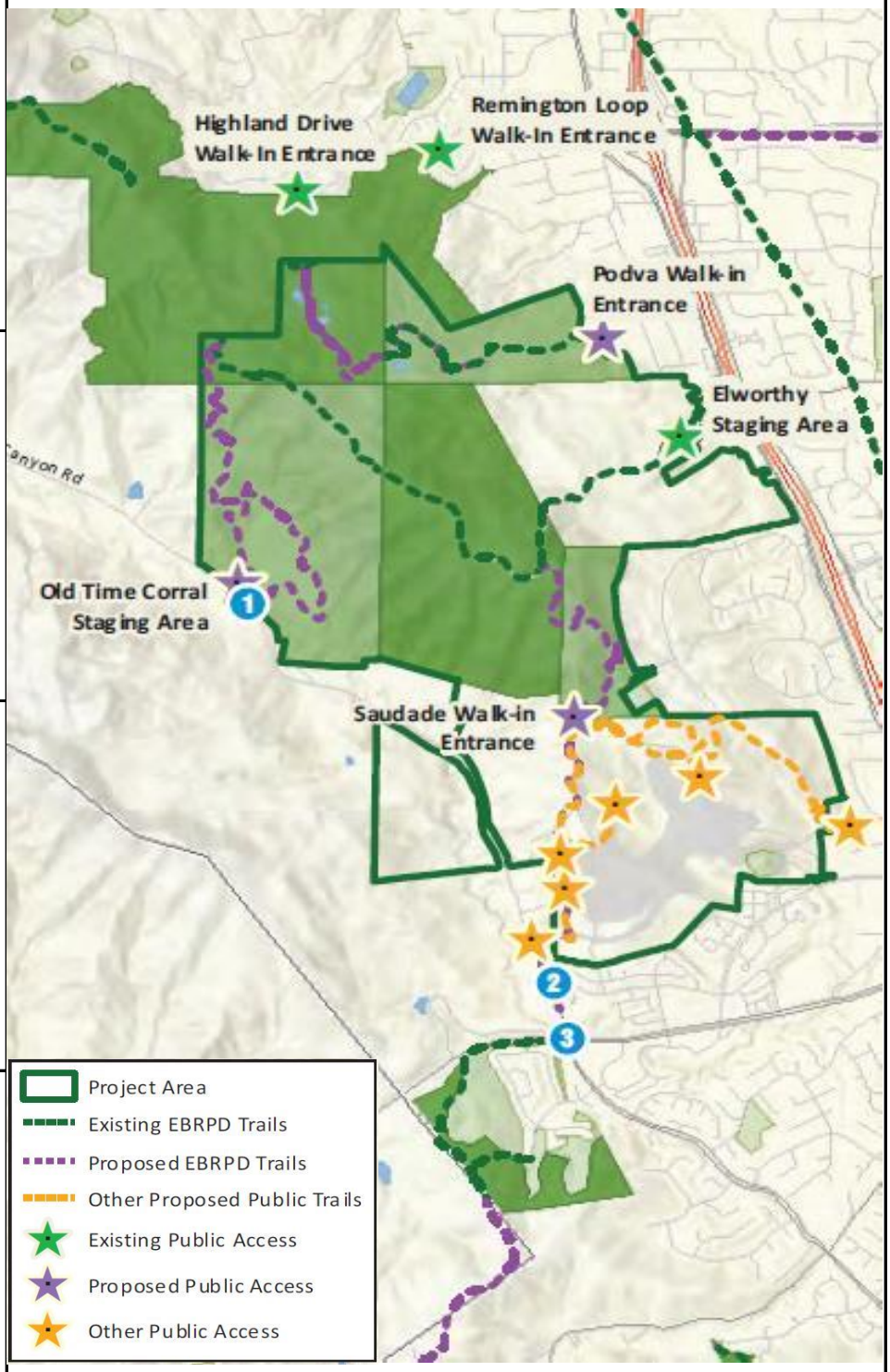
1 Bollinger Cyn Rd/Old Time Corral Staging Area



2 Bollinger Cyn Rd / Deerwood Dr



3 Bollinger Cyn Rd / Crow Cyn Rd

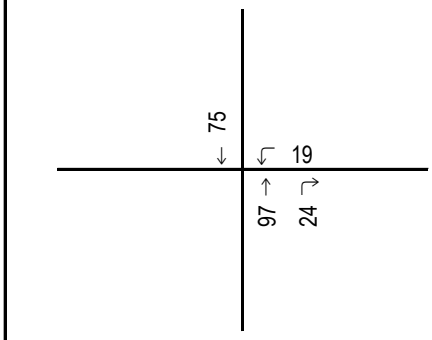


LSA

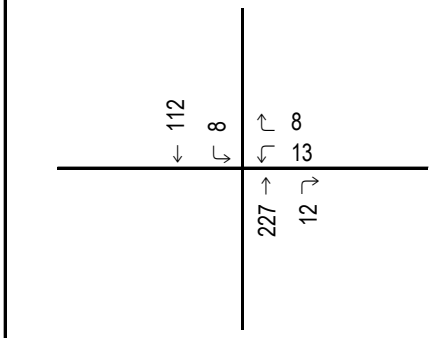
FIGURE 5

xx Saturday Peak–Hour Volume

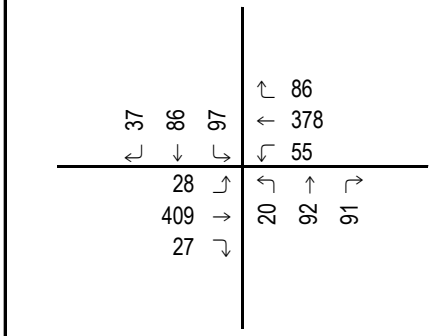
Southern Las Trampas LUPA Circulation Assessment
Existing plus Project Volumes



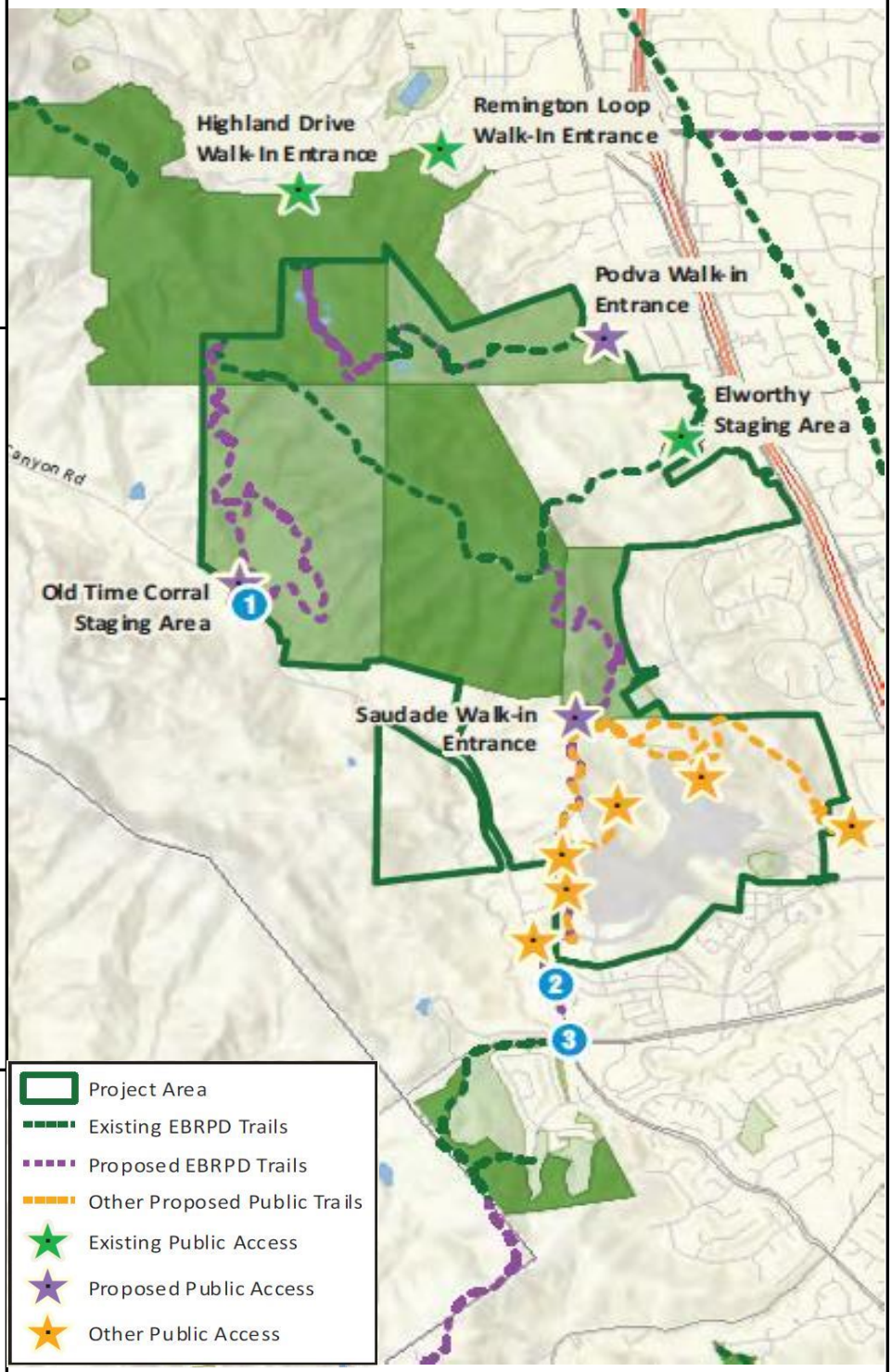
1 Bollinger Cyn Rd/Old Time Corral Staging Area



2 Bollinger Cyn Rd / Deerwood Dr



3 Bollinger Cyn Rd / Crow Cyn Rd



LSA

FIGURE 6

xx Saturday Peak–Hour Volume

Southern Las Trampas LUPA Circulation Assessment
Existing plus Future Projects plus Project Volumes

As shown on Table H, the addition of project traffic to both existing and existing plus future projects conditions will not result in any unacceptable vehicular operational levels for any of the study intersections. Appendix B includes all intersection LOS worksheets.

Table H: Plus Project Saturday Peak Hour Intersection Level of Service Summary

Intersection	Existing		Existing + Project		Existing + Future Projects		Existing + Future Projects + Project	
	ICU/ Delay	LOS	ICU/ Delay	LOS	ICU/ Delay	LOS	ICU/ Delay	LOS
1. Bollinger Canyon Road/Old Time Corral Staging Area[1]	--	--	9.7	A	--	--	9.7	A
2. Bollinger Canyon Road/ Deerwood Drive[1]	9.5	A	9.8	A	10.5	B	10.8	B
3. Bollinger Canyon Road/Crow Canyon Road	0.244	A	0.250	A	0.265	A	0.272	A

Source: Compiled by LSA (2020).
[1] Unsignalized intersection. Delay values are presented in seconds per vehicle.
ICU = intersection capacity utilization
LOS = level of service
sec = seconds
-- = location does not exist under this scenario

TRAILHEAD ACCESS ANALYSIS

This section looks at the safety of the study area and proposed trailheads for vehicles, bicyclists, and pedestrians. This analysis included input from Park District staff familiar with the Las Trampas Preserve area. Park District staff has made the observation that the accidents that occur on Bollinger Canyon Road tend to be speed related and result in vehicles running off the road. In addition to this local input, LSA conducted a review of reported accidents in the study area, as described below.

Accident History

Bollinger Canyon Road provides primary access to the proposed project. As such, LSA collected accident data for Bollinger Canyon Road from Crow Canyon Road to its northern terminus at the Bollinger Canyon Staging Area and at the intersection of Bollinger Canyon Road/Crow Canyon Road from the Safe Transportation Research and Education Center's online Transportation Injury Mapping System (TIMS). A total of eight accidents were reported for the 5-year period from January 1, 2015, to December 31, 2019. This period represents the most recent 5-year period for which TIMS can provide a complete accident history. Of these eight accidents, the following three occurred on Bollinger Canyon Road in the vicinity of the preserve:

- **Accident 1:** At 9:40 a.m. on July 25, 2015, a passenger car traveling north on Bollinger Canyon Road rear-ended another passenger car that was making a left turn from the northbound lane, approximately 1.5 miles south of Bollinger Canyon Staging Area. The collision report cited unsafe speed as the primary collision factor. The accident resulted in one injury.
- **Accident 2:** At 10:55 p.m. on May 21, 2016, a passenger car traveling southbound on Bollinger Canyon Road ran off the road and hit a fixed object, approximately 2 miles south of Bollinger Canyon Staging Area. The collision report cited unsafe speed as the primary collision factor. The accident resulted in one injury.

- **Accident 3:** At 12:37 p.m. on May 21, 2019, a westbound passenger car on Paulanella Place entering Bollinger Canyon Road hit a bicyclist who was traveling northbound on Bollinger Canyon Road. The collision report cited automobile right-of-way as the primary collision factor. The accident resulted in one injury.

The remaining five accidents occurred in or adjacent to the intersection of Bollinger Canyon Road and Crow Canyon Road:

- **Accident 4:** At 3:44 p.m. on September 29, 2017, an eastbound passenger car on Crow Canyon Road rear-ended a stopped passenger car. The collision report cited unsafe speed as the primary collision factor. The incident resulted in one injury.
- **Accident 5:** At 7:34 a.m. on May 21, 2019, a motorcyclist traveling westbound on Crow Canyon Road was injured after hitting an object. The collision report cited an unsafe lane change as the primary collision factor. The accident resulted in one injury.
- **Accident 6:** At 1:59 p.m. on June 2, 2016, a bicyclist traveling northbound on Bollinger Canyon Road was injured after hitting an object while making a right turn onto Crow Canyon Road. The collision report did not cite a collision factor. The accident resulted in an injury.
- **Accident 7:** At 4:11 p.m. on May 23, 2019, a westbound passenger car on Crow Canyon Road rear-ended a stopped truck. The collision report cited unsafe speed as the primary collision factor. The accident resulted in an injury.
- **Accident 8:** At 3:03 p.m. on March 10, 2015, an eastbound passenger car on Crow Canyon Road rear-ended a stopped passenger car. The collision report cited unsafe speed as the primary collision factor. The accident resulted in an injury.

Figure 7 shows the locations of these accidents. Only three of the eight reported accidents occurred along Bollinger Canyon Road, with the five remaining accidents a result of unsafe behavior along Crow Canyon Road. The three accidents on Bollinger Canyon Road were caused by unsafe speeds or automobile right-of-way and are consistent with Park District staff observations. The five remaining accidents at the intersection of Bollinger Canyon Road and Crow Canyon Road were also attributed to unsafe behavior, with all of the passenger car-involved accidents caused by either unsafe speeds or unsafe lane changes.

There is no consistent cause other than unsafe behavior for either the three accidents on Bollinger Canyon or the six accidents at the intersection. This indicates that the causes of these accidents are not a result of pronounced hazard in the roadway's geometry or structure. Additionally, three accidents occurred on Bollinger Canyon Road from 2015 to 2019 (less than one accident per year). Appendix C includes detailed collision reports.

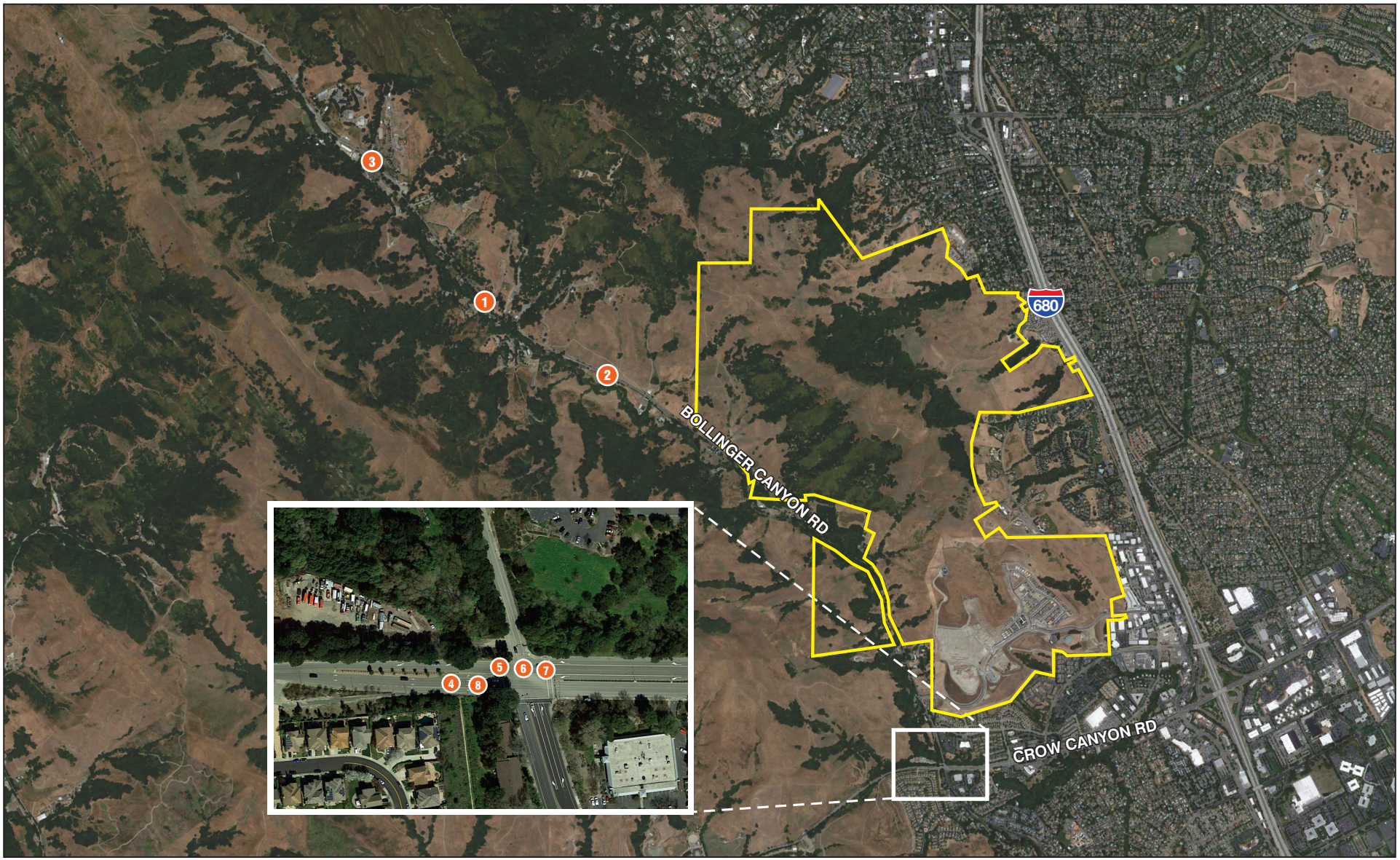


FIGURE 7

LSA

LEGEND

- # - Accident Locations
- - Project Boundary

0 1540 3080
FEET

SOURCE: Google Earth

Southern Las Trampas LUPA
Circulation Assessment

Accident Locations (2015 - 2019)

I:\EBR1702\G\Accident Locations-2015-2019.cdr (2/12/2021)

Old Time Corral Staging Area Safety Review

The California Department of Transportation (Caltrans) *Highway Design Manual,* Sixth Edition[1] recommends an unobstructed corner sight distance on a 60 mile-per-hour (mph) road of 660 feet. Even though Bollinger Canyon Road has a posted speed limit of 45 mph, a 60 mph sight line distance was taken into consideration in preliminary engineering plans for the staging area from the engineering firm of Carlson, Barbee & Gibson. The latest speed counts along Bollinger Canyon Road conducted by the Contra Costa County Public Works Department reveals 85th percentile speeds of 46 to 50 mph, which are in line with the posted speed limit of 45 mph. Specifically, this count was collected along Bollinger Canyon Road 4,500 feet north of Deerwood Drive from March 25, 2014, to March 26, 2014. Given the flat and straight roadway geometric of Bollinger Canyon Road adjacent to this staging area, a sight distance design speed of 60 mph is not unreasonable.

Figure 8 shows the sight distance lines from the Old Time Corral staging area driveway. As shown in Figure 8, the Old Time Corral Staging Area driveway is located in a manner that provides unobstructed sight lines to allow drivers to detect vehicles 660 feet to both the north and the south. Appendix D provides the County of Contra Costa (County) speed counts.

The Old Time Corral staging area is set back behind the County right-of-way for Bollinger Canyon Road, approximately 35 feet from the traveled roadway. This setback between the edge of the roadway and the County right-of-way is currently unpaved, level, all-weather compacted gravel and can provide adequate space for wider-turning vehicles.

The parking lot meets County requirements for off-street parking lots of 18-foot long parking stalls accessed from a 25-foot-wide drive aisle.

Advance signage may be provided approximately where the sight distance lines end to inform passing drivers of the upcoming staging area.

Trail Assessment

Mobility safety of different types of trail users does not end in the vehicular parking areas. This section addresses mobility-related safety concerns between different types of trail users on the trails in the proposed project. Table I summarizes all trails, both existing and proposed, that could be affected by users of either the Old Time Corral staging area or Faria trailheads.

Mobility issues that can affect the safety of various users include the potential speed differential and user conflict points between bicyclists, equestrians, and pedestrians (e.g., runners, hikers, dog walkers) at staging areas, access points, and other locations where motorized vehicles may be present. Existing trail usage observations reveal that pedestrians exclusively use the majority of trails in the preserve. Mountain biking and equestrian users make up a nominal percentage of preserve users. The proposed trails shown in Table I would not be anticipated to result in a deviation from the existing mode of preserve usage. As such, potential conflicts between different types of trail users are anticipated to be minimal on these trails, as they are restricted to pedestrians.

[1] California Department of Transportation. 2017. *Highway Design Manual,* Sixth edition. November 20.



FIGURE 8

LSA

N

0 100 200
FEET

SOURCE: Carlson, Barbee & Gibson, Inc. (August 2017), Google Earth

Southern Las Trampas LUPA
Circulation Assessment

Old Time Corral Staging Area Sight Distance

I:\EBR1702\G\Corral Staging Area Sight Distance.cdr (8/19/2020)

Table I: Las Trampas LUPA Trails

Name	Property	Description	Type	Width	Mileage
Proposed Trails					
Sabertooth Trail	Chen	Calaveras Ridge Trail (CRT) connector	EVMA/Multi-use	up to 12 feet	1.1
Extension of the Calaveras Ridge Trail	Peters Ranch	CRT connector	Multi-use	up to 6 feet	0.9
Heritage Pear Trail	Podva	CRT connector	EVMA/Multi-use	up to 12 feet	1.4
Warbler Loop Trail	Chen	CRT connector	Multi-use	up to 6 feet	0.8
				Total Proposed Trails	**4.2**
Existing Trails (and Already Open)					
Calaveras Ridge Trail through Chen and Elworthy properties	Chen	CRT connector	EVMA/Multi-use	up to 12 feet	1.3
Fiddleneck Trail	Elworthy	CRT connector	EVMA/Multi-use	up to 12 feet	0.6
				Total Existing Trails	**1.9**
				Total Las Trampas LUPA Trail Mileage	**6.1**

Source: East Bay Regional Park District (2020)
EVMA = emergency vehicle and medical access
GHAD = Geologic Hazard Abatement District
LUPA = Land Use Plan Amendment
Rec = recreational

Trail design should account for features conducive to the International Mountain Biking Association's (IMBA) guidance on trail etiquette and safety for equestrians, hikers, and mountain bikers.[1] If desired, the Park District can investigate the possible implementation of IMBA multiuse trail signs to better promote safe trail usage.

CONCLUSION

Based on this analysis of transportation operations, accident history, and compliance with applicable safety guidance at access points, the development of the project is not anticipated to result in any significant transportation or safety impacts. Based on the CCTA guidelines, passive parks are screened out from a VMT analysis, and are presumed to have a less than significant impact. In addition, the OPR TA acknowledges that a project that would generate a low volume of daily traffic may be presumed to create a less than significant impact. In order to correlate daily trip generation, VMT, and GHG emissions per the OPR TA, LSA conducted an analysis using CalEEMod and determined that a project generating up to 500 daily trips would have a less than significant impact. Because the project would generate 311 daily trips during its peak on the weekend (with fewer daily trips on a weekday), the project would not create a significant CEQA impact.

1 "Rules of the Trail". International Mountain Biking Association. Website: https://www.imba.com/sites/default/files/Team_IMBA/RulesOfTheTrail.pdf (accessed May 11, 2018).

APPENDIX A

EXISTING COUNTS

Prepared by NDS/ATD

VOLUME

18501 Bollinger Canyon Rd N/O Crow Canyon Rd

Day: Friday
Date: 9/22/2017

City: San Ramon
Project #: CA17_7780_001

DAILY TOTALS	NB	SB	EB	WB	Total
	478	499	0	0	977

AM Period	NB		SB		EB		WB		TOTAL	
00:00	1		0						1	
00:15	0		0						0	
00:30	1		0						1	
00:45	0	2	1	1					1	3
01:00	0		0						0	
01:15	0		0						0	
01:30	0		0						0	
01:45	0		1	1					1	1
02:00	0		2						2	
02:15	0		0						0	
02:30	1		0						1	
02:45	3	4	1	3					4	7
03:00	0		2						2	
03:15	0		0						0	
03:30	0		0						0	
03:45	0		0	2					0	2
04:00	0		0						0	
04:15	1		0						1	
04:30	0		0						0	
04:45	0	1	1	1					1	2
05:00	0		1						1	
05:15	0		2						2	
05:30	2		0						2	
05:45	1	3	0	3					1	6
06:00	3		1						4	
06:15	4		4						8	
06:30	3		3						6	
06:45	12	22	2	10					14	32
07:00	10		6						16	
07:15	3		9						12	
07:30	3		13						16	
07:45	6	22	11	39					17	61
08:00	3		7						10	
08:15	6		4						10	
08:30	18		6						24	
08:45	10	37	4	21					14	58
09:00	10		6						16	
09:15	12		8						20	
09:30	7		6						13	
09:45	8	37	7	27					15	64
10:00	10		7						17	
10:15	14		4						18	
10:30	12		6						18	
10:45	10	46	10	27					20	73
11:00	7		7						14	
11:15	4		11						15	
11:30	7		14						21	
11:45	8	26	14	46					22	72
TOTALS		200		181						**381**
SPLIT %		52.5%		47.5%						**39.0%**

PM Period	NB		SB		EB		WB		TOTAL	
12:00	14		7						21	
12:15	10		8						18	
12:30	14		10						24	
12:45	10	48	10	35					20	83
13:00	8		7						15	
13:15	5		6						11	
13:30	8		5						13	
13:45	7	28	13	31					20	59
14:00	8		18						26	
14:15	8		12						20	
14:30	5		12						17	
14:45	9	30	8	50					17	80
15:00	11		11						22	
15:15	9		6						15	
15:30	4		10						14	
15:45	12	36	13	40					25	76
16:00	9		13						22	
16:15	5		7						12	
16:30	8		6						14	
16:45	10	32	12	38					22	70
17:00	9		9						18	
17:15	9		8						17	
17:30	5		8						13	
17:45	13	36	4	29					17	65
18:00	3		12						15	
18:15	8		13						21	
18:30	13		8						21	
18:45	8	32	10	43					18	75
19:00	4		5						9	
19:15	3		7						10	
19:30	1		12						13	
19:45	2	10	4	28					6	38
20:00	2		2						4	
20:15	2		3						5	
20:30	3		2						5	
20:45	6	13	3	10					9	23
21:00	0		4						4	
21:15	2		2						4	
21:30	0		1						1	
21:45	0	2	1	8					1	10
22:00	2		1						3	
22:15	1		1						2	
22:30	3		0						3	
22:45	1	7	1	3					2	10
23:00	1		1						2	
23:15	1		0						1	
23:30	1		1						2	
23:45	1	4	1	3					2	7
TOTALS		278		318						**596**
SPLIT %		46.6%		53.4%						**61.0%**

DAILY TOTALS	NB	SB	EB	WB	Total
	478	499	0	0	977

AM Peak Hour	08:30	11:00			**11:45**
AM Pk Volume	50	46			**85**
Pk Hr Factor	0.694	0.821			**0.885**
7 - 9 Volume	59	60	0	0	**119**
7 - 9 Peak Hour	08:00	07:15			**07:00**
7 - 9 Pk Volume	37	40	0	0	**61**
Pk Hr Factor	0.514	0.769	0.000	0.000	**0.897**

PM Peak Hour	12:00	13:45			**12:00**
PM Pk Volume	48	55			**83**
Pk Hr Factor	0.857	0.764			**0.865**
4 - 6 Volume	68	67	0	0	**135**
4 - 6 Peak Hour	16:30	16:00			**16:30**
4 - 6 Pk Volume	36	38	0	0	**71**
Pk Hr Factor	0.900	0.731	0.000	0.000	**0.807**

Prepared by NDS/ATD

VOLUME

18501 Bollinger Canyon Rd N/O Crow Canyon Rd

Day: Saturday
Date: 9/23/2017

City: San Ramon
Project #: CA17_7780_001

DAILY TOTALS	NB	SB	EB	WB	Total
	581	599	0	0	1,180

AM Period	NB		SB		EB		WB		TOTAL	
00:00	0		1						1	
00:15	0		0						0	
00:30	0		0						0	
00:45	1	1	0	1					1	2
01:00	0		0						0	
01:15	1		0						1	
01:30	0		0						0	
01:45	0	1	1	1					1	2
02:00	0		0						0	
02:15	1		0						1	
02:30	0		1						1	
02:45	0	1	0	1					0	2
03:00	0		0						0	
03:15	0		1						1	
03:30	1		0						1	
03:45	1	2	1	2					2	4
04:00	0		0						0	
04:15	0		0						0	
04:30	1		0						1	
04:45	0	1	3	3					3	4
05:00	0		0						0	
05:15	0		1						1	
05:30	0		0						0	
05:45	1	1	0	1					1	2
06:00	2		1						3	
06:15	6		1						7	
06:30	4		3						7	
06:45	4	16	1	6					5	22
07:00	3		1						4	
07:15	8		3						11	
07:30	5		1						6	
07:45	9	25	3	8					12	33
08:00	5		9						14	
08:15	6		6						12	
08:30	12		3						15	
08:45	16	39	6	24					22	63
09:00	9		15						24	
09:15	7		11						18	
09:30	12		6						18	
09:45	12	40	7	39					19	79
10:00	6		16						22	
10:15	14		9						23	
10:30	19		10						29	
10:45	20	59	8	43					28	102
11:00	19		11						30	
11:15	19		12						31	
11:30	29		9						38	
11:45	13	80	15	47					28	127
TOTALS		266		176						**442**
SPLIT %		60.2%		39.8%						**37.5%**

PM Period	NB		SB		EB		WB		TOTAL	
12:00	24		15						39	
12:15	14		16						30	
12:30	16		8						24	
12:45	22	76	11	50					33	126
13:00	18		14						32	
13:15	9		11						20	
13:30	8		11						19	
13:45	6	41	13	49					19	90
14:00	4		17						21	
14:15	11		14						25	
14:30	8		18						26	
14:45	12	35	16	65					28	100
15:00	13		24						37	
15:15	8		20						28	
15:30	8		16						24	
15:45	10	39	20	80					30	119
16:00	10		20						30	
16:15	9		20						29	
16:30	7		11						18	
16:45	11	37	13	64					24	101
17:00	13		12						25	
17:15	8		8						16	
17:30	6		13						19	
17:45	6	33	8	41					14	74
18:00	7		9						16	
18:15	3		4						7	
18:30	3		8						11	
18:45	6	19	6	27					12	46
19:00	5		5						10	
19:15	2		2						4	
19:30	3		6						9	
19:45	0	10	5	18					5	28
20:00	2		5						7	
20:15	4		3						7	
20:30	1		2						3	
20:45	4	11	2	12					6	23
21:00	4		1						5	
21:15	1		3						4	
21:30	1		2						3	
21:45	1	7	0	6					1	13
22:00	3		3						6	
22:15	2		5						7	
22:30	0		0						0	
22:45	0	5	1	9					1	14
23:00	0		1						1	
23:15	0		0						0	
23:30	2		1						3	
23:45	0	2	0	2					0	4
TOTALS		315		423						**738**
SPLIT %		42.7%		57.3%						**62.5%**

DAILY TOTALS	NB	SB	EB	WB	Total
	581	599	0	0	1,180

AM Peak Hour	10:45	11:30			**11:15**
AM Pk Volume	87	55			**136**
Pk Hr Factor	0.750	0.859			**0.872**
7 - 9 Volume	64	32	0	0	**96**
7 - 9 Peak Hour	08:00	08:00			**08:00**
7 - 9 Pk Volume	39	24	0	0	**63**
Pk Hr Factor	0.609	0.667	0.000	0.000	**0.716**

PM Peak Hour	12:00	15:00			**12:00**
PM Pk Volume	76	80			**126**
Pk Hr Factor	0.792	0.833			**0.808**
4 - 6 Volume	70	105	0	0	**175**
4 - 6 Peak Hour	16:15	16:00			**16:00**
4 - 6 Pk Volume	40	64	0	0	**101**
Pk Hr Factor	0.769	0.800	0.000	0.000	**0.842**

Prepared by NDS/ATD

VOLUME

18501 Bollinger Canyon Rd N/O Crow Canyon Rd

Day: Sunday
Date: 9/24/2017

City: San Ramon
Project #: CA17_7780_001

DAILY TOTALS	NB	SB	EB	WB	Total
	538	528	0	0	1,066

AM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0						0	
00:15	0		0						0	
00:30	0		0						0	
00:45	0		0						0	
01:00	0		0						0	
01:15	0		0						0	
01:30	2		0						2	
01:45	0	2	0						0	2
02:00	0		0						0	
02:15	0		0						0	
02:30	0		0						0	
02:45	0		0						0	
03:00	0		0						0	
03:15	0		0						0	
03:30	0		0						0	
03:45	0		0						0	
04:00	0		0						0	
04:15	0		0						0	
04:30	0		0						0	
04:45	0		2	2					2	2
05:00	0		3						3	
05:15	0		0						0	
05:30	0		0						0	
05:45	0		0	3					0	3
06:00	0		0						0	
06:15	0		0						0	
06:30	5		2						7	
06:45	4	9	4	6					8	15
07:00	3		1						4	
07:15	4		1						5	
07:30	7		3						10	
07:45	11	25	5	10					16	35
08:00	6		1						7	
08:15	3		2						5	
08:30	12		5						17	
08:45	17	38	10	18					27	56
09:00	10		6						16	
09:15	8		3						11	
09:30	12		8						20	
09:45	15	45	14	31					29	76
10:00	20		5						25	
10:15	13		9						22	
10:30	12		12						24	
10:45	17	62	9	35					26	97
11:00	21		5						26	
11:15	11		13						24	
11:30	11		15						26	
11:45	20	63	10	43					30	106
TOTALS		244		148						**392**
SPLIT %		62.2%		37.8%						**36.8%**

PM Period	NB		SB		EB		WB		TOTAL	
12:00	15		11						26	
12:15	14		17						31	
12:30	19		10						29	
12:45	12	60	7	45					19	105
13:00	15		17						32	
13:15	18		19						37	
13:30	13		11						24	
13:45	16	62	10	57					26	119
14:00	13		13						26	
14:15	7		18						25	
14:30	9		26						35	
14:45	10	39	21	78					31	117
15:00	12		15						27	
15:15	10		16						26	
15:30	9		14						23	
15:45	5	36	11	56					16	92
16:00	10		9						19	
16:15	6		17						23	
16:30	6		14						20	
16:45	14	36	13	53					27	89
17:00	2		19						21	
17:15	7		8						15	
17:30	4		10						14	
17:45	6	19	6	43					12	62
18:00	5		6						11	
18:15	5		8						13	
18:30	1		5						6	
18:45	3	14	1	20					4	34
19:00	1		3						4	
19:15	2		1						3	
19:30	1		3						4	
19:45	4	8	3	10					7	18
20:00	2		5						7	
20:15	4		1						5	
20:30	4		2						6	
20:45	3	13	2	10					5	23
21:00	0		1						1	
21:15	2		2						4	
21:30	2		0						2	
21:45	0	4	1	4					1	8
22:00	1		0						1	
22:15	0		0						0	
22:30	1		0						1	
22:45	0	2	2	2					2	4
23:00	1		0						1	
23:15	0		1						1	
23:30	0		0						0	
23:45	0	1	1	2					1	3
TOTALS		294		380						**674**
SPLIT %		43.6%		56.4%						**63.2%**

DAILY TOTALS	NB	SB	EB	WB	Total
	538	528	0	0	1,066

AM Peak Hour	11:45	11:30			**11:45**
AM Pk Volume	68	53			**116**
Pk Hr Factor	0.850	0.779			**0.935**
7 - 9 Volume	63	28	0	0	**91**
7 - 9 Peak Hour	08:00	08:00			**08:00**
7 - 9 Pk Volume	38	18	0	0	**56**
Pk Hr Factor	0.559	0.450	0.000	0.000	**0.519**

PM Peak Hour	12:30	14:15			**13:00**
PM Pk Volume	64	80			**119**
Pk Hr Factor	0.842	0.769			**0.804**
4 - 6 Volume	55	96	0	0	**151**
4 - 6 Peak Hour	16:00	16:15			**16:15**
4 - 6 Pk Volume	36	63	0	0	**91**
Pk Hr Factor	0.643	0.829	0.000	0.000	**0.843**

Prepared by National Data & Surveying Services

Bollinger Canyon Rd & Deerwood Dr

Peak Hour Turning Movement Count

ID: 17-7808-003
City: San Ramon

Day: Saturday
Date: 10/07/2017

PEAK HOURS

AM	NONE
NOON	11:30 AM - 12:30 PM
PM	NONE

COUNT PERIODS

AM	NONE
NOON	11:15 AM - 03:15 PM
PM	NONE

Bollinger Canyon Rd — SOUTHBOUND

AM	0	0	0	0	0	AM
NOON	0	64	8	0	93	NOON
PM	0	0	0	0	0	PM

Deerwood Dr — EASTBOUND

AM	NOON	PM	
0	0	0	⇦
0	0	0	↶ 0
0	0	0	↱ 0
0	0	0	→ 0
0	0	0	↷ 0
AM	NOON	PM	

CONTROL

0

	AM	NOON	PM
TEV	0	188	0
PHF		0.87	

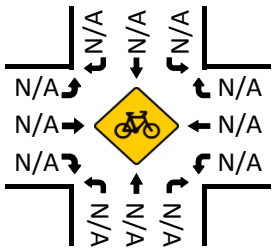
WESTBOUND — Deerwood Dr

PM	NOON	AM	
0	8	0	↶ 0
0	0	0	← 0
0	12	0	↱ 0
0	0	0	↷ 0
0	19	0	⇨
PM	NOON	AM	

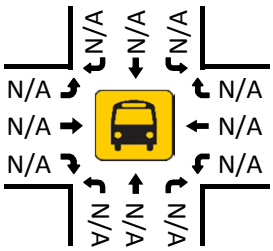
NORTHBOUND — Bollinger Canyon Rd

PM	0	0	0	0	0	PM
NOON	76	0	0	85	11	NOON
AM	0	0	0	0	0	AM

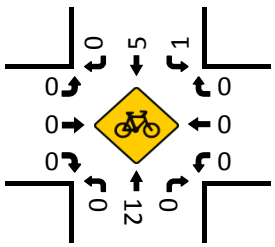
Bikes (AM)



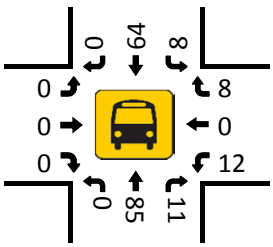
Total Vehicles (AM)



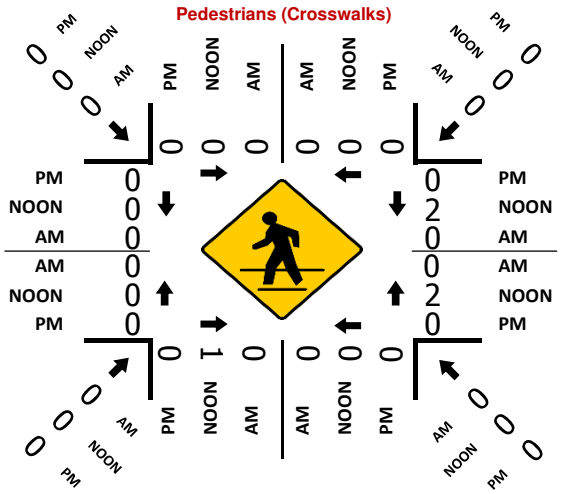
Bikes (NOON)



Total Vehicles (NOON)



Pedestrians (Crosswalks)


PM
NOON
AM
0
0
0
0
0
0
0

National Data & Surveying Services

Intersection Turning Movement Count

Location: Bollinger Canyon Rd & Deerwood Dr
City: San Ramon
Control:

Project ID: 17-7808-003
Date: 10/7/2017

Total

NS/EW Streets:	Bollinger Canyon Rd				Bollinger Canyon Rd				Deerwood Dr				Deerwood Dr				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:15 AM	0	17	2	0	1	16	0	0	0	0	0	0	4	0	1	0	41
11:30 AM	0	24	4	0	2	18	0	0	0	0	0	0	5	0	1	0	54
11:45 AM	0	21	2	0	1	13	0	0	0	0	0	0	2	0	1	0	40
12:00 PM	0	25	3	0	1	16	0	0	0	0	0	0	1	0	2	0	48
12:15 PM	0	15	2	0	4	17	0	0	0	0	0	0	4	0	4	0	46
12:30 PM	0	28	1	0	1	10	0	0	0	0	0	0	2	0	0	1	43
12:45 PM	0	16	4	0	3	13	0	0	0	0	0	0	7	0	1	0	44
1:00 PM	0	9	2	0	3	15	0	0	0	0	0	0	8	0	0	0	37
1:15 PM	0	13	6	0	0	12	0	0	0	0	0	0	3	0	0	0	34
1:30 PM	0	17	7	0	3	22	0	0	0	0	0	0	4	0	4	0	57
1:45 PM	0	14	2	0	0	15	0	0	0	0	0	0	3	0	1	0	35
2:00 PM	0	8	3	0	2	17	0	0	0	0	0	0	4	0	0	0	34
2:15 PM	0	7	3	0	0	18	0	0	0	0	0	0	2	0	1	0	31
2:30 PM	0	13	2	0	2	16	0	0	0	0	0	0	1	0	1	2	37
2:45 PM	0	7	3	0	0	23	0	0	0	0	0	0	6	0	2	0	41
3:00 PM	0	14	4	0	0	20	0	0	0	0	0	0	6	0	6	0	50
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	248	50	0	23	261	0	0	0	0	0	0	62	0	25	3	672
APPROACH %'s :	0.00%	83.22%	16.78%	0.00%	8.10%	91.90%	0.00%	0.00%					68.89%	0.00%	27.78%	3.33%	
PEAK HR :	11:30 AM - 12:30 PM																TOTAL
PEAK HR VOL :	0	85	11	0	8	64	0	0	0	0	0	0	12	0	8	0	188
PEAK HR FACTOR :	0.000	0.850	0.688	0.000	0.500	0.889	0.000	0.000	0.000	0.000	0.000	0.000	0.600	0.000	0.500	0.000	0.870
		0.857				0.857								0.625			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Bollinger Canyon Rd & Deerwood Dr
City: San Ramon
Control: 0

Project ID: 17-7808-003
Date: 10/7/2017

Bikes

NS/EW Streets:	Bollinger Canyon Rd				Bollinger Canyon Rd				Deerwood Dr				Deerwood Dr				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	4
11:45 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
12:00 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
12:15 PM	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	8
12:30 PM	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	7
12:45 PM	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	7
1:00 PM	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0	0	8
1:15 PM	0	9	0	0	1	2	0	0	0	0	0	0	0	0	0	0	12
1:30 PM	0	9	0	0	0	8	0	0	0	0	0	0	0	0	0	0	17
1:45 PM	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
2:00 PM	0	7	0	0	1	4	0	0	0	0	0	0	0	0	0	0	12
2:15 PM	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0	0	6
2:30 PM	0	4	1	0	0	4	0	0	0	0	0	0	0	0	0	0	9
2:45 PM	0	1	0	0	0	14	0	0	0	0	0	0	0	0	0	0	15
3:00 PM	0	1	0	0	0	6	0	0	0	0	0	0	0	0	0	0	7
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	64	1	0	4	55	0	0	0	0	0	0	0	0	0	0	124
APPROACH %'s :	0.00%	98.46%	1.54%	0.00%	6.78%	93.22%	0.00%	0.00%									
PEAK HR :	**11:30 AM - 12:30 PM**																TOTAL
PEAK HR VOL :	0	12	0	0	1	5	0	0	0	0	0	0	0	0	0	0	18
PEAK HR FACTOR :	0.00	0.600	0.000	0.000	0.250	0.417	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.563
		0.600				0.500											

National Data & Surveying Services

Intersection Turning Movement Count

Location: Bollinger Canyon Rd & Deerwood Dr **Project ID:** 17-7808-003
City: San Ramon **Date:** 10/7/2017

Pedestrians (Crosswalks)

NS/EW Streets:	Bollinger Canyon Rd		Bollinger Canyon Rd		Deerwood Dr		Deerwood Dr		
NOON	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	2	2	0	0	4
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	1	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	2	0	0	2
1:00 PM	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	1	0	2	4	0	0	7
APPROACH %'s :			100.00%	0.00%	33.33%	66.67%			
PEAK HR :	**11:30 AM - 12:30 PM**								TOTAL
PEAK HR VOL :	0	0	1	0	2	2	0	0	5
PEAK HR FACTOR :			0.250		0.250	0.250			0.313
			0.250		0.250				

Prepared by National Data & Surveying Services

Bollinger Canyon Rd & Crow Canyon Rd

Peak Hour Turning Movement Count

ID: 17-7808-004
City: San Ramon

Day: Saturday
Date: 10/07/2017

PEAK HOURS

AM	NONE
NOON	02:15 PM - 03:15 PM
PM	NONE

COUNT PERIODS

AM	NONE
NOON	11:15 AM - 03:15 PM
PM	NONE

Bollinger Canyon Rd — SOUTHBOUND

AM	0	0	0	0	0	AM
NOON	19	20	51	0	55	NOON
PM	0	0	0	0	0	PM

Crow Canyon Rd — EASTBOUND

AM	NOON	PM	
0	398	0	⇦
0	1	0	↶ 0
0	9	0	↱ 0
0	388	0	→ 0
0	26	0	↴ 0
AM	NOON	PM	

Crow Canyon Rd — WESTBOUND

PM	NOON	AM	
0	32	0	0 ↰
0	359	0	0 ←
0	53	0	0 ↰
0	0	0	0 ↶
0	526	0	⇨
PM	NOON	AM	

CONTROL

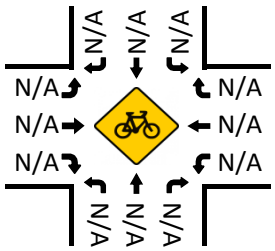
0

	AM	NOON	PM
TEV	0	1078	0
PHF		0.98	

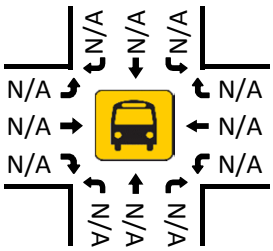
Bollinger Canyon Rd — NORTHBOUND

PM	0	0	0	0	0	PM
NOON	99	0	19	14	87	NOON
AM	0	0	0	0	0	AM

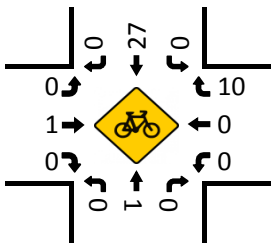
Bikes (AM)



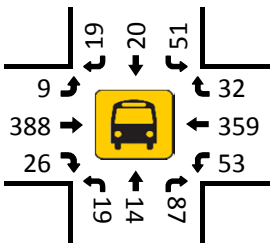
Total Vehicles (AM)



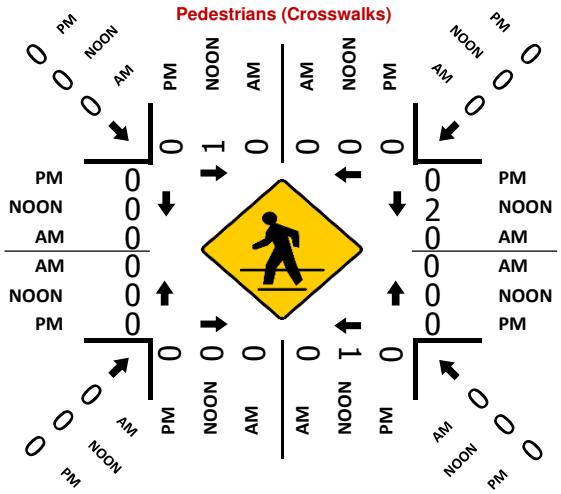
Bikes (NOON)



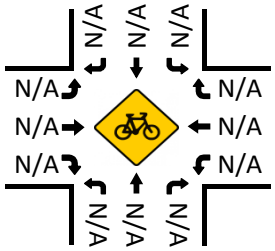
Total Vehicles (NOON)



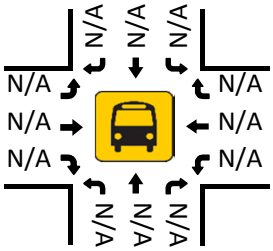
Pedestrians (Crosswalks)



Bikes (PM)



Total Vehicles (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Bollinger Canyon Rd & Crow Canyon Rd
City: San Ramon
Control:

Project ID: 17-7808-004
Date: 10/7/2017

Total

NS/EW Streets:	Bollinger Canyon Rd				Bollinger Canyon Rd				Crow Canyon Rd				Crow Canyon Rd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:15 AM	6	4	15	0	13	5	6	0	1	74	5	0	9	54	14	1	207
11:30 AM	6	4	21	0	12	5	5	0	6	87	2	0	15	70	18	2	253
11:45 AM	5	5	17	0	11	4	3	0	4	79	6	1	16	83	15	0	249
12:00 PM	5	10	13	0	8	7	2	0	0	71	3	0	27	94	18	0	258
12:15 PM	8	2	24	0	10	4	4	0	3	82	2	0	26	73	12	0	250
12:30 PM	3	9	23	0	6	5	4	0	3	101	3	0	19	81	17	0	274
12:45 PM	5	4	19	0	11	2	3	0	1	104	8	0	12	68	15	1	253
1:00 PM	5	4	20	0	7	11	8	0	2	87	8	0	19	94	5	0	270
1:15 PM	15	6	18	0	11	1	2	0	2	88	3	0	16	73	11	0	246
1:30 PM	7	8	15	2	9	11	4	0	4	111	6	0	12	79	11	0	279
1:45 PM	5	4	11	1	16	2	3	0	0	92	10	0	13	87	12	0	256
2:00 PM	8	3	18	1	13	5	4	0	3	89	4	0	14	98	5	1	266
2:15 PM	2	2	22	0	14	0	2	0	2	109	9	0	18	83	6	0	269
2:30 PM	10	5	18	0	12	6	3	0	1	89	5	0	13	93	9	0	264
2:45 PM	3	4	27	0	14	7	5	0	2	99	5	0	9	91	5	0	271
3:00 PM	4	3	20	0	11	7	9	0	4	91	7	1	13	92	12	0	274
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	97	77	301	4	178	82	67	0	38	1453	86	2	251	1313	185	5	4139
APPROACH %'s :	20.25%	16.08%	62.84%	0.84%	54.43%	25.08%	20.49%	0.00%	2.41%	92.02%	5.45%	0.13%	14.31%	74.86%	10.55%	0.29%	
PEAK HR :	02:15 PM - 03:15 PM																TOTAL
PEAK HR VOL :	19	14	87	0	51	20	19	0	9	388	26	1	53	359	32	0	1078
PEAK HR FACTOR :	0.475	0.700	0.806	0.000	0.911	0.714	0.528	0.000	0.563	0.890	0.722	0.250	0.736	0.965	0.667	0.000	0.984
	0.882				0.833				0.883				0.949				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Bollinger Canyon Rd & Crow Canyon Rd
City: San Ramon
Control: 0

Project ID: 17-7808-004
Date: 10/7/2017

Bikes

NS/EW Streets:	Bollinger Canyon Rd				Bollinger Canyon Rd				Crow Canyon Rd				Crow Canyon Rd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
11:30 AM	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
11:45 AM	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	3
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
12:15 PM	0	1	1	0	1	3	0	0	0	0	0	0	0	0	4	0	10
12:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	7	0	9
12:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	3	0	5
1:00 PM	0	1	0	0	0	3	0	0	0	2	0	0	0	0	2	0	8
1:15 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	0	8	0	13
1:30 PM	0	0	0	0	2	6	0	0	0	0	0	0	0	0	9	0	17
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5
2:00 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	7	0	10
2:15 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	5	0	7
2:30 PM	0	1	0	0	0	5	0	0	0	0	0	0	0	0	3	0	9
2:45 PM	0	0	0	0	0	14	0	0	0	1	0	0	0	0	1	0	16
3:00 PM	0	0	0	0	0	6	0	0	0	0	0	0	0	0	1	0	7
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	5	2	0	3	53	0	0	0	4	0	0	0	0	60	0	127
APPROACH %'s :	0.00%	71.43%	28.57%	0.00%	5.36%	94.64%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR :	02:15 PM - 03:15 PM																TOTAL
PEAK HR VOL :	0	1	0	0	0	27	0	0	0	1	0	0	0	0	10	0	39
PEAK HR FACTOR :	0.00	0.250	0.000	0.000	0.000	0.482	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.500	0.000	0.609
		0.250				0.482				0.250				0.500			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Bollinger Canyon Rd & Crow Canyon Rd **Project ID:** 17-7808-004
City: San Ramon **Date:** 10/7/2017

Pedestrians (Crosswalks)

NS/EW Streets:	Bollinger Canyon Rd		Bollinger Canyon Rd		Crow Canyon Rd		Crow Canyon Rd		
NOON	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	1	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	3	0	0	3
12:15 PM	0	0	0	1	0	1	0	0	2
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	1	0	0	0	0	0	1
1:00 PM	0	0	3	0	1	0	0	0	4
1:15 PM	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0
1:45 PM	0	1	2	0	1	0	0	0	4
2:00 PM	0	0	0	0	0	0	0	0	0
2:15 PM	1	0	0	0	0	1	0	0	2
2:30 PM	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	1	0	1	0	0	2
3:00 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	1	1	6	2	3	6	0	0	19
APPROACH %'s :	50.00%	50.00%	75.00%	25.00%	33.33%	66.67%			
PEAK HR :	**02:15 PM - 03:15 PM**								TOTAL
PEAK HR VOL :	1	0	0	1	0	2	0	0	4
PEAK HR FACTOR :	0.250			0.250		0.500			0.500
	0.250		0.250		0.500				

APPENDIX B

LOS WORKSHEETS

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	97	0	0	75
Future Vol, veh/h	0	0	97	0	0	75
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, %	2	2	2	2	2	2
Mvmt Flow	0	0	105	0	0	82

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	187	105	0	0	105	0
Stage 1	105	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	802	949	-	-	1486	-
Stage 1	919	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	802	949	-	-	1486	-
Mov Cap-2 Maneuver	802	-	-	-	-	-
Stage 1	919	-	-	-	-	-
Stage 2	941	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1486	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	8	89	12	8	67
Future Vol, veh/h	13	8	89	12	8	67
Conflicting Peds, #/hr	1	0	0	4	4	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	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	9	102	14	9	77

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	209	113	0	0	120	0
Stage 1	113	-	-	-	-	-
Stage 2	96	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	779	940	-	-	1468	-
Stage 1	912	-	-	-	-	-
Stage 2	928	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	770	936	-	-	1462	-
Mov Cap-2 Maneuver	770	-	-	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	922	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	826	1462	-
HCM Lane V/C Ratio	-	-	0.029	0.006	-
HCM Control Delay (s)	-	-	9.5	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	97	0	0	75
Future Vol, veh/h	0	0	97	0	0	75
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, %	2	2	2	2	2	2
Mvmt Flow	0	0	105	0	0	82

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	187	105	0	0	105	0
Stage 1	105	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	802	949	-	-	1486	-
Stage 1	919	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	802	949	-	-	1486	-
Mov Cap-2 Maneuver	802	-	-	-	-	-
Stage 1	919	-	-	-	-	-
Stage 2	941	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1486	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	8	203	12	8	93
Future Vol, veh/h	13	8	203	12	8	93
Conflicting Peds, #/hr	1	0	0	4	4	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	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	9	233	14	9	107

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	370	244	0	0	251	0
Stage 1	244	-	-	-	-	-
Stage 2	126	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	630	795	-	-	1314	-
Stage 1	797	-	-	-	-	-
Stage 2	900	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	622	792	-	-	1309	-
Mov Cap-2 Maneuver	622	-	-	-	-	-
Stage 1	794	-	-	-	-	-
Stage 2	893	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	677	1309	-
HCM Lane V/C Ratio	-	-	0.036	0.007	-
HCM Control Delay (s)	-	-	10.5	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	0	97	24	0	75
Future Vol, veh/h	19	0	97	24	0	75
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, %	2	2	2	2	2	2
Mvmt Flow	21	0	105	26	0	82

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	200	118	0	0	131	0
Stage 1	118	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	789	934	-	-	1454	-
Stage 1	907	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	789	934	-	-	1454	-
Mov Cap-2 Maneuver	789	-	-	-	-	-
Stage 1	907	-	-	-	-	-
Stage 2	941	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	789	1454	-
HCM Lane V/C Ratio	-	-	0.026	-	-
HCM Control Delay (s)	-	-	9.7	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	8	113	12	8	86
Future Vol, veh/h	13	8	113	12	8	86
Conflicting Peds, #/hr	1	0	0	4	4	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	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	9	130	14	9	99

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	259	141	0	0	148	0
Stage 1	141	-	-	-	-	-
Stage 2	118	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	730	907	-	-	1434	-
Stage 1	886	-	-	-	-	-
Stage 2	907	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	721	904	-	-	1429	-
Mov Cap-2 Maneuver	721	-	-	-	-	-
Stage 1	882	-	-	-	-	-
Stage 2	900	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	781	1429	-
HCM Lane V/C Ratio	-	-	0.031	0.006	-
HCM Control Delay (s)	-	-	9.8	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	0	97	24	0	75
Future Vol, veh/h	19	0	97	24	0	75
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, %	2	2	2	2	2	2
Mvmt Flow	21	0	105	26	0	82

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	200	118	0	0	131	0
Stage 1	118	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	789	934	-	-	1454	-
Stage 1	907	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	789	934	-	-	1454	-
Mov Cap-2 Maneuver	789	-	-	-	-	-
Stage 1	907	-	-	-	-	-
Stage 2	941	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	789	1454	-
HCM Lane V/C Ratio	-	-	0.026	-	-
HCM Control Delay (s)	-	-	9.7	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	8	227	12	8	112
Future Vol, veh/h	13	8	227	12	8	112
Conflicting Peds, #/hr	1	0	0	4	4	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	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	9	261	14	9	129

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	420	272	0	0	279	0
Stage 1	272	-	-	-	-	-
Stage 2	148	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	590	767	-	-	1284	-
Stage 1	774	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	582	764	-	-	1279	-
Mov Cap-2 Maneuver	582	-	-	-	-	-
Stage 1	771	-	-	-	-	-
Stage 2	872	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	640	1279	-
HCM Lane V/C Ratio	-	-	0.038	0.007	-
HCM Control Delay (s)	-	-	10.8	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Las Trampas Regional Wilderness Preserve LUPA Traffic Analysis
Existing Conditions
Saturday Mid-Day Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 Bollinger Canyon Road (NS) / Crow Canyon Road (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.244
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	30	Level Of Service:	A

Street Name:	Bollinger Canyon Road						Crow Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 1	0 1	1	0 0	1 0	1	0 2	0 1	1	0 2	0 1
Volume Module:												
Base Vol:	20	15	91	53	21	20	10	406	27	55	375	33
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	20	15	91	53	21	20	10	406	27	55	375	33
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	20	15	91	53	21	20	10	406	27	55	375	33
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	20	15	91	53	21	20	10	406	27	55	375	33
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	20	15	91	53	21	20	10	406	27	55	375	33
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	0.51	0.49	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1650	1650	1650	1650	845	805	1650	3300	1650	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.01	0.01	0.06	0.03	0.02	0.02	0.01	0.12	0.02	0.03	0.11	0.02
Crit Moves:			****	****				****		****		

Las Trampas Regional Wilderness Preserve LUPA Traffic Analysis
Existing + Related Projects Conditions
Saturday Mid-Day Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 Bollinger Canyon Road (NS) / Crow Canyon Road (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.265
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	31	Level Of Service:	A

Street Name:	Bollinger Canyon Road						Crow Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 1	0 1	1	0	0 1	0	1	0 2	0 1	1	0 2 0 1
Volume Module:												
Base Vol:	20	86	91	86	82	33	24	409	27	55	378	72
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	20	86	91	86	82	33	24	409	27	55	378	72
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	20	86	91	86	82	33	24	409	27	55	378	72
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	20	86	91	86	82	33	24	409	27	55	378	72
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	20	86	91	86	82	33	24	409	27	55	378	72
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	0.71	0.29	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1650	1650	1650	1650	1177	473	1650	3300	1650	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.01	0.05	0.06	0.05	0.07	0.07	0.01	0.12	0.02	0.03	0.11	0.04
Crit Moves:			****	****				****		****		

Las Trampas Regional Wilderness Preserve LUPA Traffic Analysis
Existing + Project Conditions
Saturday Mid-Day Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 Bollinger Canyon Road (NS) / Crow Canyon Road (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.250
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	30	Level Of Service:	A

Street Name:	Bollinger Canyon Road						Crow Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 1	0 1	1	0 0	1 0	1	0 2	0 1	1	0 2	0 1
Volume Module:												
Base Vol:	20	21	91	64	25	24	14	406	27	55	375	47
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	20	21	91	64	25	24	14	406	27	55	375	47
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	20	21	91	64	25	24	14	406	27	55	375	47
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	20	21	91	64	25	24	14	406	27	55	375	47
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	20	21	91	64	25	24	14	406	27	55	375	47
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	0.51	0.49	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1650	1650	1650	1650	842	808	1650	3300	1650	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.01	0.01	0.06	0.04	0.03	0.03	0.01	0.12	0.02	0.03	0.11	0.03
Crit Moves:			****	****				****		****		

Las Trampas Regional Wilderness Preserve LUPA Traffic Analysis
Existing + Related Projects + Project Conditions
Saturday Mid-Day Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 Bollinger Canyon Road (NS) / Crow Canyon Road (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.272
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	31	Level Of Service:	A

Street Name:	Bollinger Canyon Road						Crow Canyon Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1 0	1	1 0	0 1	0	1 0	2 0	1	1 0	2 0	1
Volume Module:												
Base Vol:	20	92	91	97	86	37	28	409	27	55	378	86
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	20	92	91	97	86	37	28	409	27	55	378	86
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	20	92	91	97	86	37	28	409	27	55	378	86
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	20	92	91	97	86	37	28	409	27	55	378	86
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	20	92	91	97	86	37	28	409	27	55	378	86
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	0.70	0.30	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1650	1650	1650	1650	1154	496	1650	3300	1650	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.01	0.06	0.06	0.06	0.07	0.07	0.02	0.12	0.02	0.03	0.11	0.05
Crit Moves:		****		****				****		****		

APPENDIX C

ACCIDENT DATA

BerkeleySafeTREC

Collision Details for: Case ID 7014555

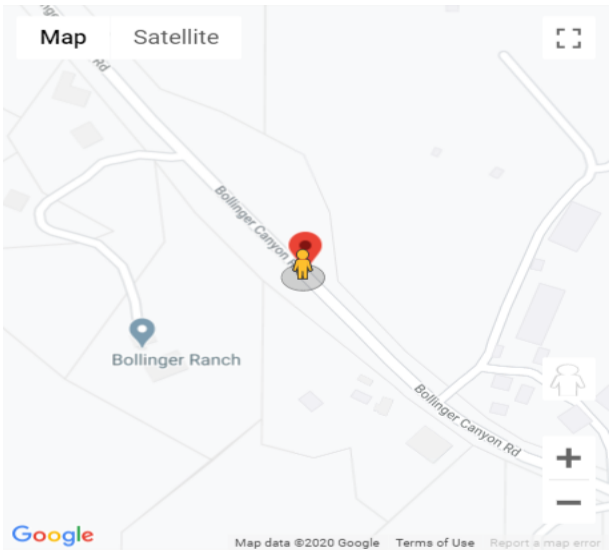
Collision Information

County	Contra Costa
City	Unincorporated
Date & Time (M/D/Y HH:MM)	07/25/2015 09:40
Location (Intersection)	Bollinger Canyon Rd & Bollinger Estates Ct
Dist. & Dir. from Intersection	2112.00 ft South
State Highway	No
Latidude & Longitude	37.8003379, -122.0305571

Type of Collision	C - Rear End
Motor Vehicle Involved With	C - Other Motor Vehicle
Collision Severity	3 - Injury (Other Visible)
PCF Violation Category	03 - Unsafe Speed
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View



Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	North	B - Proceeding Straight
2	1 - Driver (including Hit and Run)	D - Pickup or Panel Truck	No	North	E - Making Left Turn

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
2	1 - Driver	M - Male	41	6 - Suspected Minor Injury

BerkeleySafeTREC

Collision Details for: Case ID 90201863

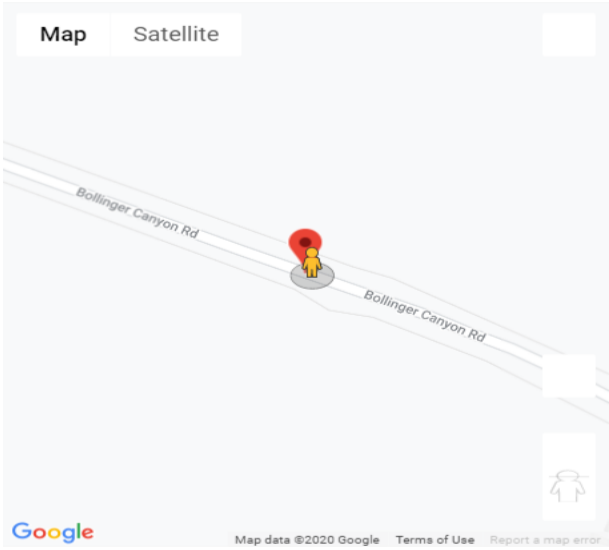
Collision Information

County	Contra Costa
City	Unincorporated
Date & Time (M/D/Y HH:MM)	05/21/2016 22:55
Location (Intersection)	Bollinger Canyon Road (18700 Block) & Bollinger Estates Court
Dist. & Dir. from Intersection	5280.00 ft South
State Highway	No
Latidude & Longitude	37.795943, -122.0212319

Type of Collision	E - Hit Object
Motor Vehicle Involved With	I - Fixed Object
Collision Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	03 - Unsafe Speed
Weather	B - Cloudy
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View



Parties: 1

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	South	C - Ran Off Road

Victims: 3

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	2 - Passenger	M - Male	15	0 - No Injury
1	2 - Passenger	F - Female	16	0 - No Injury
1	2 - Passenger	M - Male	15	7 - Possible Injury

Collision Details for: Case ID 90998850

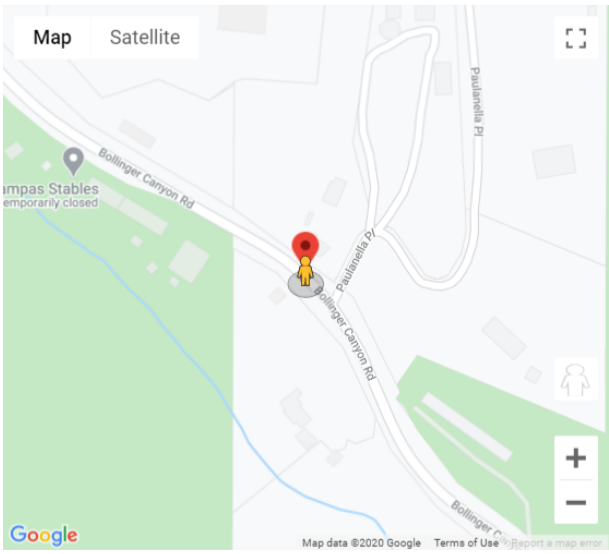
Collision Information

County	Contra Costa
City	Unincorporated
Date & Time (M/D/Y HH:MM)	05/21/2019 12:37
Location (Intersection)	Bollinger Canyon Rd. (18000 Blk.) & Paulanella Pl.
Dist. & Dir. from Intersection	110.00 ft North
State Highway Info	Route Number: N/A : : : : Side of Hwy: N/A : : : : Postmile: N/A : : : : Location Type: N/A : : : :
Latidude & Longitude	37.8088951, -122.0391693

Type of Collision	D - Broadside
Motor Vehicle Involved With	G - Bicycle
Collision Severity	3 - Injury (Other Visible)
PCF Violation Category	09 - Automobile Right of Way
Weather	B - Cloudy
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	Yes
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View



Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	West	L - Entering Traffic
2	4 - Bicyclist	L - Bicycle	No	North	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
2	4 - Bicyclist	M - Male	63	6 - Suspected Minor Injury

BerkeleySafeTREC

Collision Details for: Case ID 8473371

Collision Information

County	Contra Costa
City	San Ramon
Date & Time (M/D/Y HH:MM)	09/29/2017 15:44
Location (Intersection)	Crow Canyon Rd & Bollinger Canyon Rd
Dist. & Dir. from Intersection	100.00 ft West
State Highway	No
Latidude & Longitude	37.7726274, -121.9962959

Type of Collision	C - Rear End
Motor Vehicle Involved With	C - Other Motor Vehicle
Collision Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	03 - Unsafe Speed
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View



Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	East	H - Slowing/Stopping
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	H - Slowing/Stopping

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
2	1 - Driver	M - Male	74	7 - Possible Injury

Collision Details for: Case ID 8870216

Collision Information

County	Contra Costa
City	San Ramon
Date & Time (M/D/Y HH:MM)	05/21/2019 07:34
Location (Intersection)	Crow Canyon Rd & Bollinger Canyon Rd
Dist. & Dir. from Intersection	6.00 ft West
State Highway	No
Latidude & Longitude	37.7726212, -121.9959717

Type of Collision	E - Hit Object
Motor Vehicle Involved With	I - Fixed Object
Collision Severity	3 - Injury (Other Visible)
PCF Violation Category	07 - Unsafe Lane Change
Weather	B - Cloudy
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	Yes	**Truck Accident**	No

Map View



Street View



Parties: 1

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	C - Motorcycle/Scooter	Yes	West	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	1 - Driver	M - Male	49	6 - Suspected Minor Injury

BerkeleySafeTREC

Collision Details for: Case ID 8117009

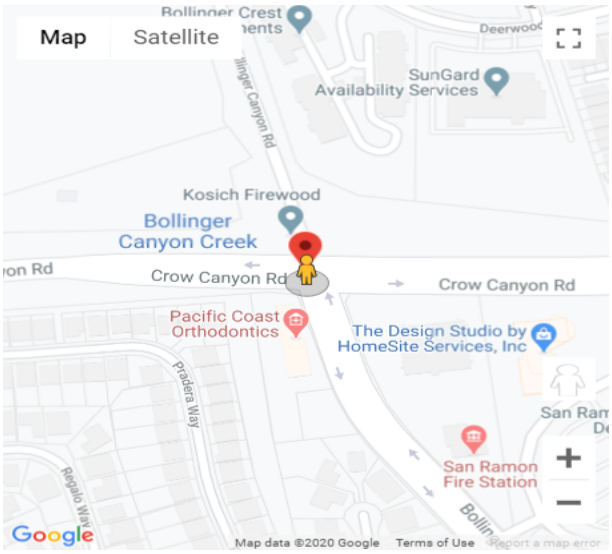
Collision Information

County	Contra Costa
City	San Ramon
Date & Time (M/D/Y HH:MM)	06/02/2016 13:59
Location (Intersection)	Crow Canyon Rd & Bollinger Canyon Rd
Dist. & Dir. from Intersection	At Intersection
State Highway	No
Latidude & Longitude	37.77262, -121.99595

Type of Collision	F - Overturned
Motor Vehicle Involved With	I - Fixed Object
Collision Severity	2 - Injury (Severe)
PCF Violation Category	00 - Unknown
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	Yes
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View



Parties: 1

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	4 - Bicyclist	L - Bicycle	No	North	D - Making Right Turn

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	4 - Bicyclist	F - Female	61	5 - Suspected Serious Injury

BerkeleySafeTREC

Collision Details for: Case ID 8872845

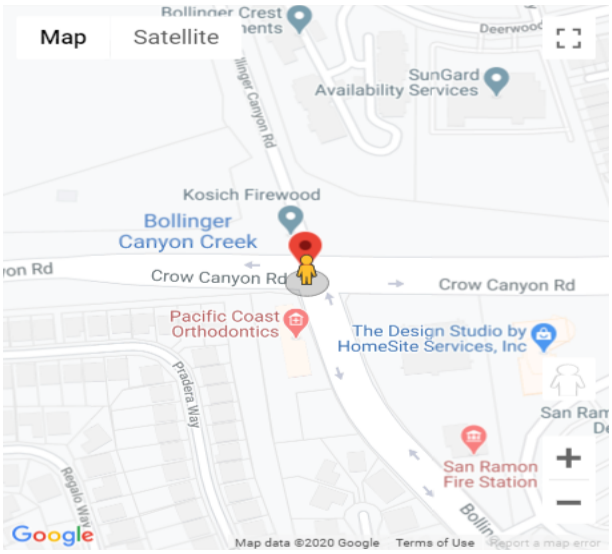
Collision Information

County	Contra Costa
City	San Ramon
Date & Time (M/D/Y HH:MM)	05/23/2019 16:11
Location (Intersection)	Crow Canyon Rd & Bollinger Canyon Rd
Dist. & Dir. from Intersection	At Intersection
State Highway	No
Latidude & Longitude	37.7726212, -121.9959488

Type of Collision	C - Rear End
Motor Vehicle Involved With	C - Other Motor Vehicle
Collision Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	03 - Unsafe Speed
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	Yes

Map View



Street View



Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	West	B - Proceeding Straight
2	1 - Driver (including Hit and Run)	F - Truck or Truck Tractor	No	West	A - Stopped

Victims: 3

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	2 - Passenger	- - Not Stated	5	0 - No Injury
2	1 - Driver	M - Male	38	7 - Possible Injury
2	2 - Passenger	M - Male	32	0 - No Injury

BerkeleySafeTREC

Collision Details for: Case ID 6842231

Collision Information

County	Contra Costa
City	San Ramon
Date & Time (M/D/Y HH:MM)	03/10/2015 15:03
Location (Intersection)	Crow Canyon Rd & Bollinger Canyon Rd
Dist. & Dir. from Intersection	90.00 ft West
State Highway	No
Latidude & Longitude	37.7726266, -121.9962614

Type of Collision	C - Rear End
Motor Vehicle Involved With	C - Other Motor Vehicle
Collision Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	03 - Unsafe Speed
Weather	B - Cloudy
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View



Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	East	B - Proceeding Straight
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	A - Stopped

Victims: 2

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	2 - Passenger	F - Female	19	0 - No Injury
2	2 - Passenger	M - Male	86	7 - Possible Injury

APPENDIX D

BOLLINGER CANYON ROAD SPEED SURVEY

HI-STAR NC-97 by Nu-Metrics
Dir Volume x Speed Program

CONTRA COSTA COUNTY
PUBLIC WORKS DEPARTMENT
SPEED / VOLUME COUNTS

Interval 15 Minutes
Report By D. KLAPPERICH

Station **4,500' N of DEERWOOD DR.**
No. of Lanes **2**

Road No. **2842 B**
Road Name **BOLLINGER CANYON RD**
Date **25 Mar '14**
Day of Week **Tuesday**

N / B SPEED IN MILES PER HOUR

HOUR	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-99	TOTAL
00:00 - 01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
01:00 - 02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
02:00 - 03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
03:00 - 04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
04:00 - 05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
05:00 - 06:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**1**
06:00 - 07:00	0	0	0	0	1	0	1	2	5	8	7	0	0	0	0	**24**
07:00 - 08:00	0	0	0	0	0	2	1	5	5	6	1	2	1	0	0	**23**
08:00 - 09:00	0	0	0	0	0	0	3	4	13	4	2	0	1	0	0	**27**
09:00 - 10:00	0	0	0	0	1	1	4	8	13	6	0	1	0	0	0	**34**
10:00 - 11:00	0	0	0	0	0	1	8	12	6	3	2	1	0	0	0	**33**
11:00 - 12:00	0	0	2	0	0	3	3	6	8	5	2	2	0	0	0	**31**
12:00 - 13:00	0	0	0	0	0	2	6	5	7	4	2	1	0	0	0	**27**
13:00 - 14:00	0	0	1	0	0	0	2	9	11	8	1	1	0	0	0	**33**
14:00 - 15:00	0	0	0	0	0	2	4	5	5	2	0	0	0	0	0	**18**
15:00 - 16:00	0	0	0	1	1	0	7	7	10	3	1	1	1	0	0	**32**
16:00 - 17:00	0	0	0	0	0	1	3	3	9	7	0	0	0	0	0	**23**
17:00 - 18:00	0	0	0	0	0	3	1	3	7	2	2	2	1	0	0	**21**
18:00 - 19:00	0	0	0	1	0	2	1	8	5	5	2	1	0	0	0	**25**
19:00 - 20:00	0	0	0	0	0	0	5	5	12	11	2	0	1	0	0	**36**
20:00 - 21:00	0	0	0	0	0	0	1	5	7	4	1	0	0	0	0	**18**
21:00 - 22:00	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	**2**
22:00 - 23:00	0	0	0	0	0	1	2	1	1	0	0	0	0	0	0	**5**
23:00 - 24:00	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	**2**
	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	== ===
TOTALS	**0**	**0**	**3**	**2**	**3**	**18**	**52**	**91**	**126**	**78**	**25**	**12**	**5**	**0**	**0**	**415**
%	**0.0%**	**0.0%**	**0.7%**	**0.5%**	**0.7%**	**4.3%**	**12.5%**	**21.9%**	**30.4%**	**18.8%**	**6.0%**	**2.9%**	**1.2%**	**0.0%**	**0.0%**	**100%**

N/B PEAK
A.M. = 39
08:45 - 09:45
P.M. = 44
18:30 - 19:30

S/B PEAK
A.M. = 41
11:45 - 12:45
P.M. = 51
12:30 - 13:30

>55	%>55	>60	%>60	>65	%>65	15%ile	50%ile	85%ile	Avg Spd
17	**4.1%**	**5**	**1.2%**	**0**	**0.0%**	**31-35**	**41-45**	**46-50**	**41.7**

M.P.H.

POSTED SPEED LIMIT
45
MPH

HI-STAR NC-97 by Nu-Metrics
Dir Volume x Speed Program

CONTRA COSTA COUNTY
PUBLIC WORKS DEPARTMENT
SPEED / VOLUME COUNTS

Interval 15 Minutes
Report By D. KLAPPERICH

Station **4,500' N of DEERWOOD DR.**
No. of Lanes **2**

Road No. **2842 B**
Road Name **BOLLINGER CANYON RD**
Date **25 Mar '14**
Day of Week **Tuesday**

S / B SPEED IN MILES PER HOUR

HOUR	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-99	TOTAL
00:00 - 01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
01:00 - 02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
02:00 - 03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
03:00 - 04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
04:00 - 05:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**1**
05:00 - 06:00	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	**3**
06:00 - 07:00	0	0	0	0	0	1	0	3	3	0	0	1	0	0	0	**8**
07:00 - 08:00	0	0	0	0	1	1	8	9	8	7	3	0	1	0	0	**38**
08:00 - 09:00	0	0	0	0	1	0	2	4	3	3	1	1	0	0	0	**15**
09:00 - 10:00	0	0	0	0	0	4	4	6	5	3	0	0	1	0	0	**23**
10:00 - 11:00	0	0	0	0	0	1	8	7	4	1	1	1	0	0	0	**23**
11:00 - 12:00	0	0	0	0	2	3	10	12	6	3	0	2	1	0	0	**39**
12:00 - 13:00	0	1	1	0	2	6	9	12	7	3	3	0	1	0	0	**45**
13:00 - 14:00	0	0	0	0	0	4	5	6	6	1	2	1	0	0	0	**25**
14:00 - 15:00	0	0	0	0	0	2	7	11	6	2	1	1	0	0	0	**30**
15:00 - 16:00	0	0	0	0	0	4	6	6	3	4	2	0	0	0	0	**25**
16:00 - 17:00	0	0	0	0	0	2	6	7	5	3	3	1	0	1	0	**28**
17:00 - 18:00	0	0	0	0	1	4	4	10	2	4	0	2	0	0	0	**27**
18:00 - 19:00	0	0	0	0	0	3	4	7	2	2	0	1	0	0	0	**19**
19:00 - 20:00	0	0	0	0	0	0	3	11	5	3	2	0	0	0	0	**24**
20:00 - 21:00	0	0	0	0	1	2	6	8	6	4	1	0	0	0	0	**28**
21:00 - 22:00	0	0	0	0	0	0	2	3	3	0	1	0	0	0	0	**9**
22:00 - 23:00	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	**3**
23:00 - 24:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	== ===
TOTALS	**0**	**1**	**1**	**0**	**8**	**38**	**85**	**124**	**75**	**45**	**20**	**11**	**4**	**1**	**0**	**413**
%	**0.0%**	**0.2%**	**0.2%**	**0.0%**	**1.9%**	**9.2%**	**20.6%**	**30.0%**	**18.2%**	**10.9%**	**4.8%**	**2.7%**	**1.0%**	**0.2%**	**0.0%**	**100%**

>55	%>55	>60	%>60	>65	%>65	15%ile	50%ile	85%ile	Avg Spd
16	**3.9%**	**5**	**1.2%**	**1**	**0.2%**	**31-35**	**36-40**	**46-50**	**39.2**

M.P.H.

N/B PEAK
A.M. = 39
08:45 - 09:45
P.M. = 44
18:30 - 19:30

S/B PEAK
A.M. = 41
11:45 - 12:45
P.M. = 51
12:30 - 13:30

POSTED SPEED LIMIT
45
MPH

HI-STAR NC-97 by Nu-Metrics
Dir Volume x Speed Program

CONTRA COSTA COUNTY
PUBLIC WORKS DEPARTMENT
SPEED / VOLUME COUNTS

Interval 15 Minutes
Report By D. KLAPPERICH

Station **4,500' N of DEERWOOD DR.**
No. of Lanes **2**

Road No. **2842 B**
Road Name **BOLLINGER CANYON RD**
Date **26 Mar '14**
Day of Week **Wednesday**

N / B SPEED IN MILES PER HOUR

HOUR	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-99	TOTAL
00:00 - 01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
01:00 - 02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
02:00 - 03:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**1**
03:00 - 04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
04:00 - 05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
05:00 - 06:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**1**
06:00 - 07:00	0	0	0	0	0	2	1	4	13	7	1	0	0	0	0	**28**
07:00 - 08:00	0	0	0	0	0	1	2	7	6	1	2	1	0	0	0	**20**
08:00 - 09:00	0	0	0	0	0	1	4	6	3	3	0	0	1	0	0	**18**
09:00 - 10:00	0	0	0	0	0	1	5	7	5	2	0	0	0	0	0	**20**
10:00 - 11:00	0	0	0	0	2	2	1	7	10	5	0	0	0	0	0	**27**
11:00 - 12:00	0	0	0	0	0	1	6	5	11	2	4	0	0	0	0	**29**
12:00 - 13:00	0	0	0	0	0	0	5	8	2	6	1	1	0	0	0	**23**
13:00 - 14:00	0	1	1	1	1	1	3	5	6	1	1	1	0	1	0	**23**
14:00 - 15:00	0	0	0	0	0	1	1	8	7	7	1	2	0	0	0	**27**
15:00 - 16:00	0	0	0	0	0	1	4	3	10	13	4	0	1	1	0	**37**
16:00 - 17:00	0	0	0	0	0	1	2	5	12	9	3	0	0	0	0	**32**
17:00 - 18:00	0	0	0	0	0	2	2	5	5	2	1	1	0	0	0	**18**
18:00 - 19:00	0	0	0	0	0	1	3	4	5	3	1	3	0	0	0	**20**
19:00 - 20:00	0	0	0	0	0	1	3	4	9	4	1	0	0	0	0	**22**
20:00 - 21:00	0	0	0	1	1	2	2	3	4	3	0	0	1	0	0	**17**
21:00 - 22:00	0	0	0	0	0	0	1	3	1	0	0	0	0	0	0	**5**
22:00 - 23:00	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	**3**
23:00 - 24:00	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	**2**
	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	== ===
TOTALS	**0**	**1**	**1**	**2**	**4**	**19**	**47**	**87**	**109**	**69**	**20**	**9**	**3**	**2**	**0**	**373**
%	**0.0%**	**0.3%**	**0.3%**	**0.5%**	**1.1%**	**5.1%**	**12.6%**	**23.3%**	**29.2%**	**18.5%**	**5.4%**	**2.4%**	**0.8%**	**0.5%**	**0.0%**	**100%**

N/B PEAK
A.M. = 35
06:30 - 07:30
P.M. = 38
16:15 - 17:15

S/B PEAK
A.M. = 34
07:00 - 08:00
P.M. = 49
16:45 - 17:45

>55	%>55	>60	%>60	>65	%>65	15%ile	50%ile	85%ile	Avg Spd
14	**3.8%**	**5**	**1.3%**	**2**	**0.5%**	**31-35**	**41-45**	**46-50**	**41.4**

M.P.H.

POSTED SPEED LIMIT
45
MPH

HI-STAR NC-97 by Nu-Metrics
Dir Volume x Speed Program

CONTRA COSTA COUNTY
PUBLIC WORKS DEPARTMENT
SPEED / VOLUME COUNTS

Interval 15 Minutes
Report By D. KLAPPERICH

Station **4,500' N of DEERWOOD DR.**
No. of Lanes **2**

Road No. **2842 B**
Road Name **BOLLINGER CANYON RD**
Date **26 Mar '14**
Day of Week **Wednesday**

S / B SPEED IN MILES PER HOUR

HOUR	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-99	TOTAL
00:00 - 01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
01:00 - 02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
02:00 - 03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
03:00 - 04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
04:00 - 05:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**1**
05:00 - 06:00	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	**3**
06:00 - 07:00	0	0	0	0	0	0	1	5	1	1	0	0	0	0	0	**8**
07:00 - 08:00	0	0	0	0	1	2	11	6	6	3	2	3	0	0	0	**34**
08:00 - 09:00	0	0	0	0	1	2	2	9	4	0	1	0	0	0	0	**19**
09:00 - 10:00	0	0	0	0	0	1	3	5	2	1	2	0	0	0	0	**14**
10:00 - 11:00	0	0	0	1	0	5	6	13	5	1	1	1	0	0	0	**33**
11:00 - 12:00	0	0	1	0	0	2	6	9	2	1	1	0	0	0	0	**22**
12:00 - 13:00	0	0	0	0	0	4	5	5	5	4	0	0	0	0	0	**23**
13:00 - 14:00	0	0	0	0	0	2	8	9	4	0	1	1	0	0	0	**25**
14:00 - 15:00	0	0	0	0	1	1	4	4	9	3	2	2	0	0	0	**26**
15:00 - 16:00	0	0	0	0	2	4	3	7	7	5	0	1	1	0	1	**31**
16:00 - 17:00	0	0	0	0	0	1	3	11	12	6	3	1	0	0	0	**37**
17:00 - 18:00	0	0	0	1	1	2	11	10	6	3	5	1	0	0	0	**40**
18:00 - 19:00	0	1	0	0	3	0	5	2	5	3	1	1	0	0	0	**21**
19:00 - 20:00	0	0	0	0	0	3	5	3	5	1	0	0	0	0	0	**17**
20:00 - 21:00	0	0	0	0	0	0	1	3	2	0	0	0	0	0	0	**6**
21:00 - 22:00	0	0	0	0	0	3	3	2	1	0	0	0	0	0	0	**9**
22:00 - 23:00	0	0	0	0	0	0	3	0	5	0	0	1	0	0	0	**9**
23:00 - 24:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**1**
	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	= ===	== ===
TOTALS	**0**	**1**	**1**	**2**	**9**	**32**	**81**	**103**	**83**	**34**	**19**	**12**	**1**	**0**	**1**	**379**
%	**0.0%**	**0.3%**	**0.3%**	**0.5%**	**2.4%**	**8.4%**	**21.4%**	**27.2%**	**21.9%**	**9.0%**	**5.0%**	**3.2%**	**0.3%**	**0.0%**	**0.3%**	**100%**

N/B PEAK
A.M. = 35
06:30 - 07:30
P.M. = 38
16:15 - 17:15

S/B PEAK
A.M. = 34
07:00 - 08:00
P.M. = 49
16:45 - 17:45

>55	%>55	>60	%>60	>65	%>65	15%ile	50%ile	85%ile	Avg Spd
14	**3.7%**	**2**	**0.5%**	**1**	**0.3%**	**31-35**	**36-40**	**46-50**	**39.0**

M.P.H.

POSTED SPEED LIMIT
45
MPH