



*Transportation Impact Analysis*

# **Franklin Canyon RV Resort and Golf Course**

Contra Costa County

Prepared by:  
Abrams Associates  
1875 Olympic Boulevard, Suite 210  
Walnut Creek CA 94596



**Abrams Associates**  
TRAFFIC ENGINEERING, INC.

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# Franklin Canyon RV Resort and Golf Course

## Contra Costa County

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### TRANSPORTATION IMPACT ANALYSIS

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#### 1) EXECUTIVE SUMMARY

This traffic impact study describes the existing and future conditions for transportation with and without the proposed RV resort development. The study presents information on the regional and local roadway networks, pedestrian and transit conditions, and provides an analysis of the effects on transportation facilities associated with the project.

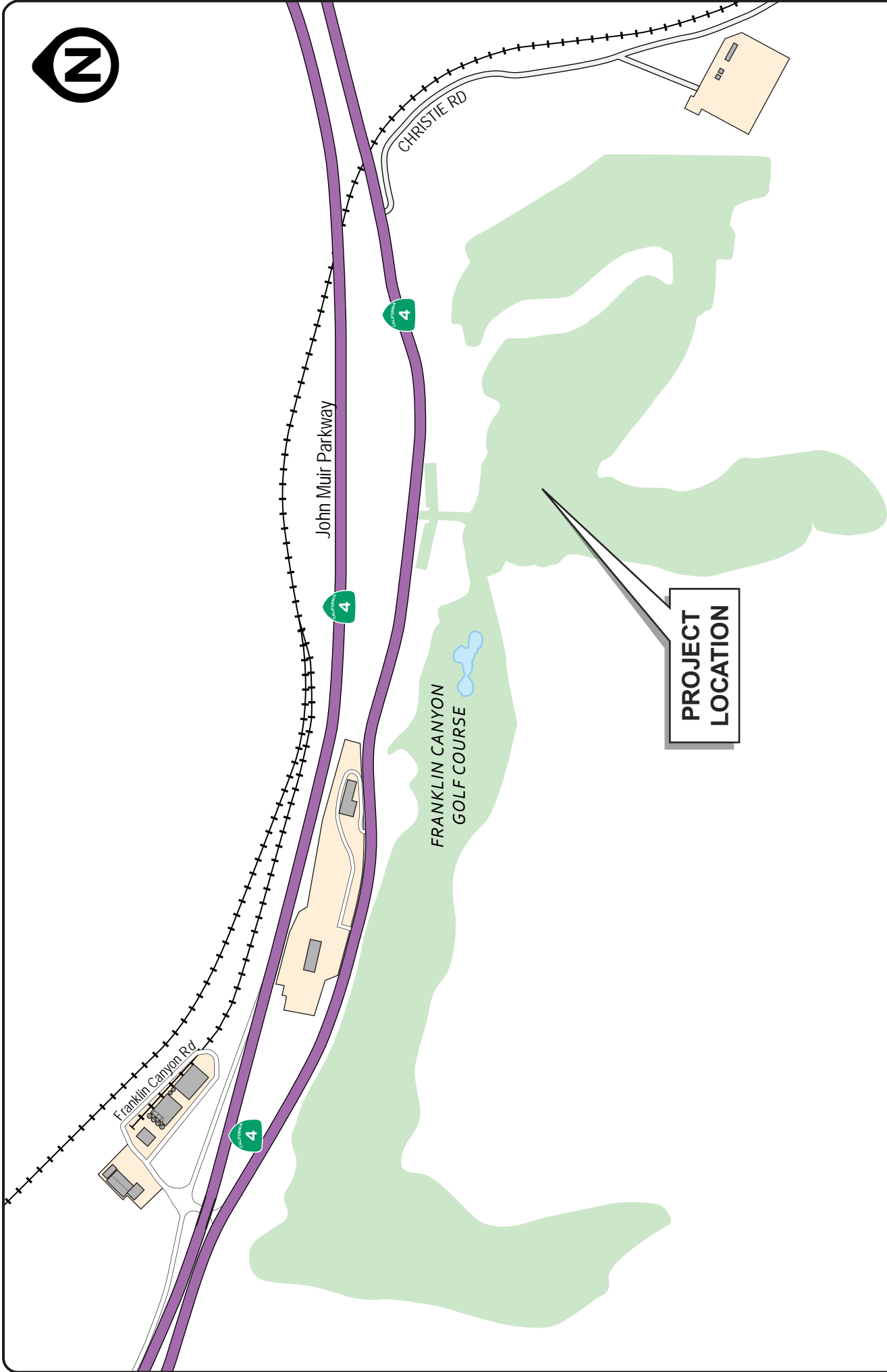
This study also describes the regulatory setting; the criterion used for determining the significance of environmental impacts; and summarizes potential environmental impacts and appropriate mitigation measures. This study has been conducted in accordance with the requirements and methodologies set forth by Contra Costa County, the Contra Costa County Transportation Authority (CCTA), Caltrans, and the applicable provisions of CEQA. Based on this analysis the project would not cause significant impacts in the study area and no off-site vehicular traffic mitigations would be required.

#### 2) PROJECT DESCRIPTION

The proposed project involves construction of an RV resort with 160 RV spaces and 22 walk-in campsites with tent bungalows provided. The project would eliminate the existing 18-hole golf course but would retain the existing driving range and involve construction of a new 18-hole putting course. The project would also include a 50 space RV storage facility and is proposing to include provide a staging area for the John Muir Land Trust with a restroom, drinking fountain, picnic tables and 50 parking spaces. The project is located south of State Highway 4 at the existing Franklin Canyon Golf Course in unincorporated Contra Costa County. All access to the site will be from the existing access to the golf course on State Highway 4. A secondary access onto Christie Road is proposed for emergency vehicles only. **Figure 1** shows the location of the project and the surrounding roadway network. **Figure 2** shows the proposed site plan for the project.

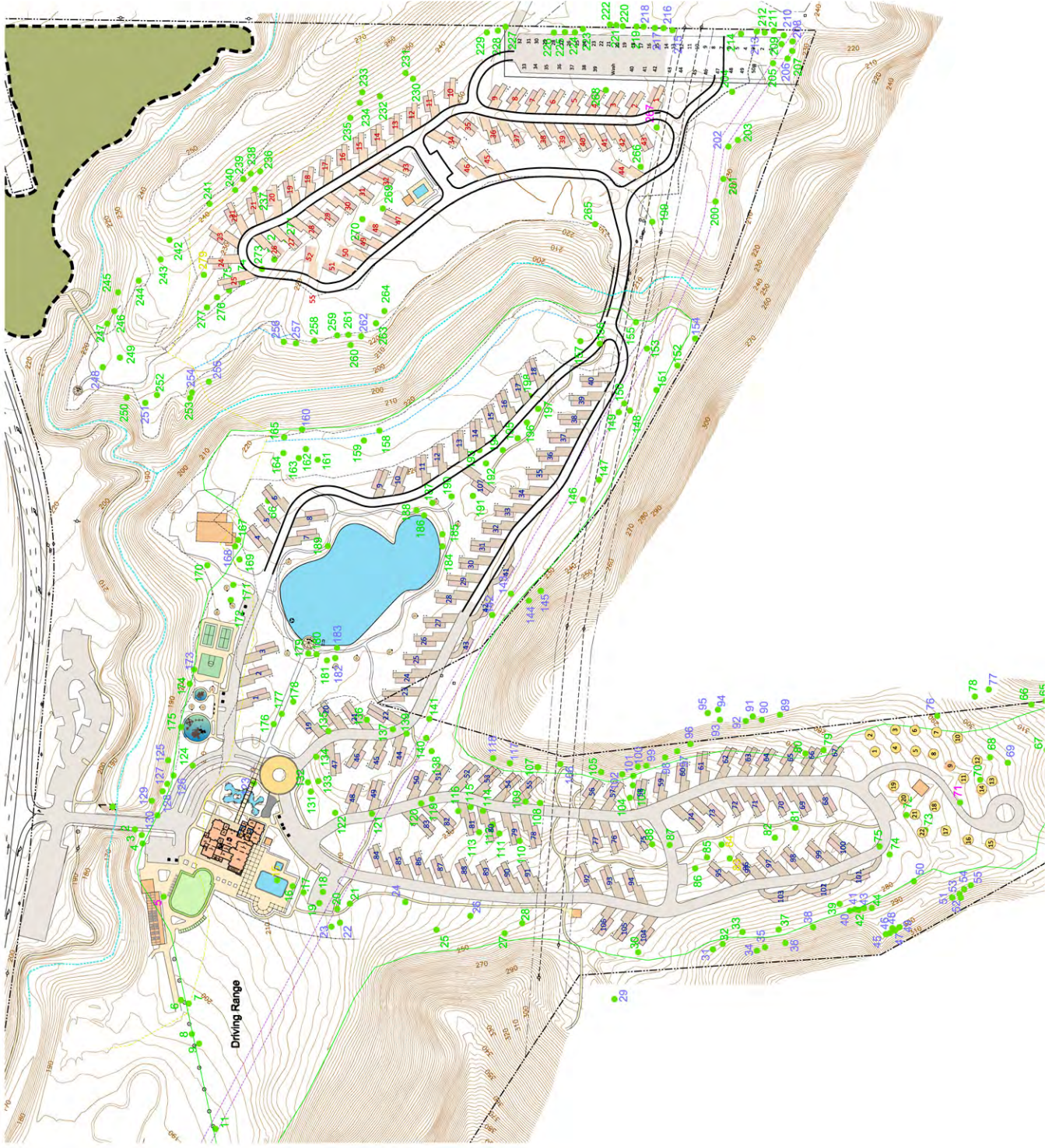
#### 3) ENVIRONMENTAL SETTING

This section of the report describes the roadways, traffic conditions and other existing transportation characteristics in the vicinity of the project. The primary basis of the analysis is the peak hour level of service for the key intersections. The hours identified as the “peak” hours are generally between 7:00 a.m. and 8:00 a.m. and from 4:30 p.m. to 5:30 p.m. for the majority of the transportation facilities described. Throughout this report, these peak hours will be identified as the AM and PM peak hours, respectively.



**FIGURE 1 | PROJECT LOCATION**  
**TRANSPORTATION IMPACT ANALYSIS**  
Franklin Canyon RV Resort and Golf Course  
**Contra Costa County**





**FIGURE 2 | SITE PLAN**  
**TRANSPORTATION IMPACT ANALYSIS**  
**Franklin Canyon RV Resort and Golf Course**  
**Contra Costa County**

### 3.1 Project Study Intersections

Based on the project's trip generation and the potential for traffic impacts the only intersection analyzed was the main project entrance onto State Route 4, which is subject to approval by County staff. **Figure 1** shows the location of the project study intersection. As mentioned above, all access to the site will be from this existing access to the Franklin Canyon Golf Course, which is currently controlled with a stop sign on the side street approach. Please note there were no intersections identified where over 50 peak hour trips could potentially be added, requiring analysis in accordance with the Contra Costa Transportation Authority's Technical Procedures (January, 2013) and Caltrans' Guidelines for the Preparation of Traffic Impact Studies (December 2002).

### 3.2 Traffic Analysis Scenarios

The study intersections were evaluated for the following six scenarios:

- Scenario 1: *Existing Conditions* – Level of Service (LOS) based on existing peak hour volumes and existing intersection configurations.
- Scenario 2: *Existing Plus Project* – Existing traffic volumes plus trips from the proposed project.
- Scenario 3: *Baseline (No Project) Conditions* – The Baseline scenario is based on the existing volumes plus growth in background traffic (for three years) and accounts for traffic from all reasonably foreseeable developments that could substantially affect the volumes at the project study intersections.
- Scenario 4: *Baseline Plus Project Conditions* – This scenario is based on the Baseline traffic volumes plus the trips from the proposed project.
- Scenario 5: *Cumulative Conditions* – This scenario includes year 2040 cumulative volumes based on planned and approved projects and the most recent release of the Countywide Travel Demand Model.
- Scenario 6: *Cumulative Plus Project Conditions* – This scenario includes year 2040 cumulative volumes based on the most recent release of the Countywide Travel Demand Model plus the trips from the proposed project.

### 3.3 Existing Roadway Network

As discussed previously, the project location and the surrounding roadway network are illustrated in **Figure 1**. The following is a more detailed description of the roadways that could be affected by the project:

- **State Route 4** – SR 4 is the primary east-west corridor in northern Contra Costa County. It connects Interstate 80 in the city of Hercules to the west with the cities of Oakley and Brentwood to the east. SR 4 is currently a four-lane highway with limited access in the vicinity of the proposed project and a speed limit of 55 mph
- **Christie Road** – Christie Road is a two lane dead end local road that extends south from SR 4 just east of the proposed project and has a prima facie speed limit of 25 mph.



### 3.4 Ramp Merge Analysis Methodology

Highway Capacity Software was used to analyze the ramp merge area at the existing access to the Franklin Canyon Golf Course. Ramp area operating conditions are dependent upon traffic volumes and the ramp characteristics. These characteristics include the length and type of acceleration/deceleration lanes, free-flow speed of the ramps, number of freeway and acceleration/deceleration lanes, grade along the facility, and the types of facilities that a ramp connects to. **Table 1** summarizes the density thresholds for level of service A to F for ramp merge/diverge areas. The HCM ramp merge/diverge methodology does have certain limitations. It does not apply when the traffic along a segment is influenced by downstream blockages or queuing, nor does it apply when free-flow speeds are below 55 miles per hour (mph). Also, the Highway Capacity Manual requires that several criteria be considered in addition to density so that LOS F is assumed to be automatically attained for a ramp if:

At an on-ramp, volume exceeds capacity in:

- The segment of a freeway downstream, or
- The merge-area defined by the on-ramp and the two adjacent freeway lanes,

Or at an off-ramp volume exceeds capacity in:

- The segment of a freeway upstream OR downstream,
- The off-ramp itself, or
- The diverge-area defined by the two adjacent freeway lanes approaching the ramp.

**TABLE 1**  
**LEVEL OF SERVICE AND DENSITY FOR RAMP MERGE / DIVERGE AREAS**

LEVEL OF SERVICE	MAXIMUM DENSITY (pc/mi/ln)
A	10
B	20
C	28
D	35
E	>35
F	Demand Exceeds Capacity

**SOURCE:** Highway Capacity Manual, Sixth Edition.

**NOTES:** Density is presented in terms of passenger cars per mile per lane.

**3.5 State Route 4 Delay Index Methodology** - The delay index measures travel congestion and is expressed as the ratio of the time required to travel between two points during the peak hour (the congested travel time) and the time required during un-congested off-peak times.<sup>1</sup> A delay index of 2.0 means that congested travel time is twice as long as during an off-peak travel time. The following shows the formula for calculating delay indices:

Delay Index = Free Flow Travel Time / Measured Peak Hour Travel Time

<sup>1</sup> *Technical Procedures*, Contra Costa Transportation Authority, Walnut Creek, CA, January 16, 2013.

### 3.6 Existing Capacity Conditions (Scenario 1)

Traffic counts at the existing access to the Franklin Canyon Golf Course and on the adjacent segment of State Route 4 were conducted in September of 2018 at times when local schools were in session. The existing intersection geometry at the project entrance and the existing traffic volumes are shown in **Figure 3**. **Table 2** summarizes the associated LOS computation results for the existing weekday AM and PM peak hour conditions. Please note that the corresponding LOS analysis calculation sheets are presented in the technical appendix to this report. As shown in **Table 2**, the ramp merge at the existing golf course entrance on State Route 4 currently has acceptable conditions (LOS D or better) during the weekday AM and PM peak hours.

**TABLE 2**  
**EXISTING RAMP MERGE AREA LEVEL OF SERVICE CONDITIONS**

LOCATION	PEAK HOUR	EXISTING	
		Density	LOS
Franklin Canyon Golf Course On-Ramp Merge With Eastbound SR 4	AM	24.5	C
	PM	22.4	C

**SOURCE:** Abrams Associates, 2019

**NOTES:** Density is presented in terms of passenger cars per mile per lane.

### 3.7 Pedestrian and Bicycle Facilities

Bicycle paths, lanes and routes are typical examples of bicycle transportation facilities, which are defined by Caltrans as being in one of the following three classes:

*Class I* – Provides a completely separated facility designed for the exclusive use of bicyclists and pedestrians with crossing points minimized.

*Class II* – Provides a restricted right-of-way designated lane for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and cross-flows by pedestrians and motorists permitted.

*Class III* – Provides a route designated by signs or permanent markings and shared with pedestrians and motorists.

There are no sidewalks or bicycle lanes along State Route 4 in the project study area.

### 3.8 Transit Service

Transit service in Western Contra Costa County is provided by Westcat. Bus Route 30Z to Martinez operates on the adjacent segment of State Route 4 but there are no bus stops near the project site. The nearest bus stops are located about 3 miles away in the City of Hercules. From the Hercules Transit Center there are connections to BART which provides regional transportation connections to much of the Bay Area. It runs from the North Bay Area in Richmond to the South Bay Area in Fremont and in the east-west direction it runs from Antioch to the San Francisco Airport.





## 4) REGULATORY CONTEXT

Existing policies, laws and regulations that apply to the proposed project are summarized below.

### 4.1 State

The California Department of Transportation (Caltrans) has jurisdiction over State highways. The Guide for the Preparation of Traffic Impact Studies provides consistent guidance for Caltrans staff reviewing development/land use change proposals. The Guide also informs local agencies about information needed for Caltrans to analyze the traffic impacts to state highway facilities which include freeway segments, on- or off-ramps, and signalized intersections.

### 4.2 Local

**Contra Costa Countywide Transportation Plan Update (2014)** - The transportation policies that are currently applicable within Contra Costa County are based on the Contra Costa County Transportation Plan. This document identifies standards and procedures for analyzing transportation impacts in the county.

**Contra Costa County General Plan** - The Transportation and Circulation Element included in the Contra Costa County General Plan was prepared pursuant to Section 65302(b) of the California Government Code. The Transportation and Circulation Element addresses existing and planned transportation routes, terminals, and other local public utilities and facilities. The General Plan identifies roadway and transit goals and policies that have been adopted to ensure that the transportation system of the County will have adequate capacity to serve planned growth. These goals and policies are intended to provide a plan and implementation measures for an integrated, multi-modal transportation system that will safely and efficiently meet the transportation needs of all economic and social segments of the County.

### 4.3 Significance Criteria

The goal of Contra Costa County is to maintain LOS D or better at all intersections and the West County Action Plan also establishes a maximum delay index of 2.0.<sup>2</sup> Please note that for the Caltrans freeway facilities in the area the operational standards and significance criteria are established by the CCTA acting as the designated Congestion Management Agency (CMA) representing the jurisdictions of Contra Costa County. As the acting CMA the CCTA establishes the traffic LOS standards for all state highway facilities in Contra Costa County, which supersede the general Caltrans operational standard for all state highways. As the designated Congestion Management Agency (CMA) representing the jurisdictions of Contra Costa County, the Contra Costa Transportation Authority (the Authority) is responsible for preparing and adopting a Congestion Management Program (CMP). Consistent with the CMP legislation, the Authority establishes the level-of-service standards for the CMP network.

Intersection Significance Thresholds - Project-related operational impacts on the signalized study intersections in Contra Costa County are considered significant if project-related traffic causes the Level of Service (LOS) rating to deteriorate beyond Level of Service (LOS) D during the peak commute hours.

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<sup>2</sup> *West County Action Plan for Routes of Regional Significance*, Fehr & Peers, Walnut Creek, CA, September, 2017.

State Route 4 Delay Index - For State Route 4 freeway the West County Action Plan specifies a maximum delay index of 2.0. It is important to note that achievement of the MTSO delay index and average speed for the segment adjacent to the proposed project is measured from Interstate 80 to the Cummings Skyway.

According to CEQA guidelines, a project would have a significant impact if it would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths and mass transit.
- Conflict with an applicable congestion management program, including, but not limited to, level-of-service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency vehicle access.
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

## 5) IMPACTS AND MITIGATION MEASURES

### 5.1 Project Trip Generation

The proposed project would involve construction of 160 RV spaces and 22 walk-in campsites with tent bungalows provided. The project would eliminate the existing 18-hole golf course but would retain the existing driving range and involve construction of a new 18-hole putting course. For the purposes of the trip generation forecasts it was assumed the proposed putting course would generate approximately the same amount of traffic as a 9-hole golf course. Therefore the trip generation only accounts for removal of the traffic associated with the 9 holes that would be displaced by the RV Resort portion of the project. The project would also include a 50 space RV storage facility and is proposing to include provide a staging area for the John Muir Land Trust with a restroom, drinking fountain, picnic tables and 50 parking spaces. Please note the campground trip generation is based on the number of occupied campsites and for the purposes of these calculations it is assumed the average peak campground occupancy (on weekends) would be 80%. The trip generation calculations are shown in **Table 3**. They are based on rates from the Institute of Transportation Engineer's (ITE) Trip Generation Manual, 10<sup>th</sup> Edition.

**TABLE 3  
TRIP GENERATION CALCULATIONS**

<i>Land Use</i>	<i>Size</i>	<i>ADT</i>	<i>AM Peak Hour</i>			<i>PM Peak Hour</i>		
			<i>In</i>	<i>Out</i>	<i>Total</i>	<i>In</i>	<i>Out</i>	<i>Total</i>
Campground/RV Park Trip Rates (ITE Land Use Code 416)		0.95	0.08	0.13	0.21	0.18	0.19	0.27
Unadjusted Campground/RV Park Trip Generation	182 sites	173	14	24	38	32	17	49
Reduction for Occupancy (20%)		35	3	5	8	6	4	10
Net New Campground/RV Park Trip Generation		138	11	19	30	26	13	39
RV/Self-Storage Trip Rates (ITE Land Use Code 151)		17.96	0.71	0.68	1.39	0.977	0.98	1.95
RV Storage Facility Trip Generation	50 units	9	1	0	1	0	1	1
<i>Subtotals for the Proposed Project</i>		<i>147</i>	<i>12</i>	<i>19</i>	<i>31</i>	<i>26</i>	<i>14</i>	<i>40</i>
Golf Course Trip Rates (ITE Land Use Code 430)		30.38	1.39	0.37	1.76	1.54	1.37	2.91
Existing Portion of the Golf Course Being Removed	9 holes	273	13	3	16	14	12	26
<i>Net New Project Trip Generation</i>		<i>-126</i>	<i>-1</i>	<i>16</i>	<i>15</i>	<i>12</i>	<i>2</i>	<i>14</i>

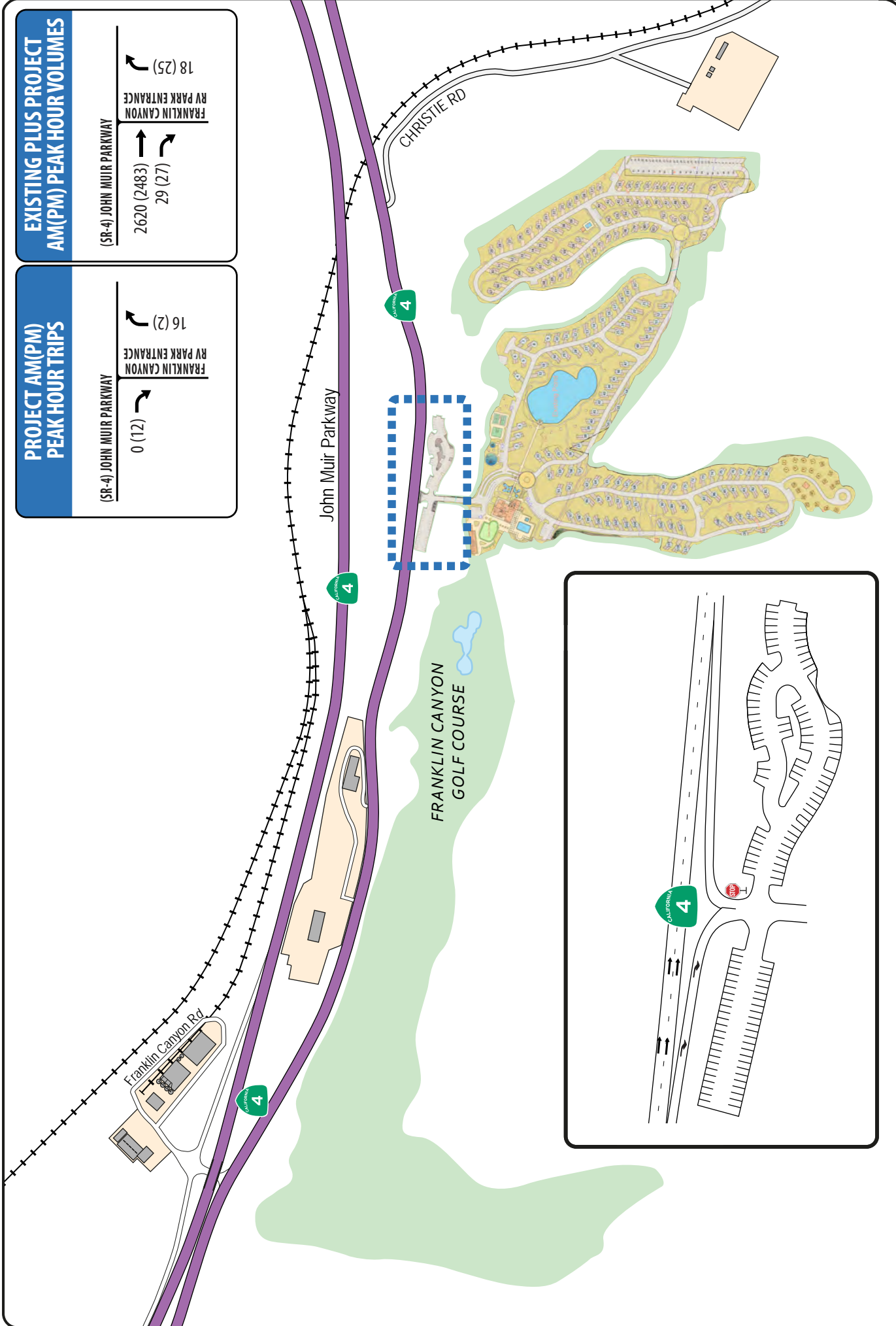
The total trip generation reflects all vehicle trips that would be counted at the project driveways, both inbound and outbound. As shown in **Table 3**, the project is forecast to generate approximately 15 net new vehicle trips during the AM and PM peak hours. To determine the worst-case impacts, the trips generated are estimated for the peak commute hours of 7:00 a.m. and 8:00 a.m. and 4:30 p.m. and 5:30 p.m., which represent the peak of “*adjacent street traffic*”. This is when the project traffic would contribute to the greatest amount of congestion.

## 5.2 Project Trip Distribution

The trip distribution assumptions are based on the project’s proximity to regional roadways, the directional split at nearby intersections, and the land use patterns in the area. **Figure 4** shows the project traffic that is forecast to be added at the entrance to the Franklin Canyon Golf Course.

## 5.3 Existing Plus Project Traffic Capacity Conditions (Scenario 2)

This scenario evaluates the existing conditions with the addition of traffic from the proposed project. The capacity calculations for the Existing Plus Project scenario are shown in **Table 4** and the resulting volumes at the project study intersections are shown in **Figure 4**. Please note that the corresponding LOS analysis calculation sheets are presented in the Technical Appendix to this report. As shown in **Table 4**, the ramp merge at the existing golf course entrance on State Route 4 is forecast to continue to have acceptable conditions (LOS D or better) during the weekday AM and PM peak hours with the addition of traffic from the proposed project.



**FIGURE 4 | EXISTING PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES**  
**TRANSPORTATION IMPACT ANALYSIS**  
 Franklin Canyon RV Resort and Golf Course  
 Contra Costa County



**TABLE 4**  
**EXISTING PLUS PROJECT RAMP MERGE AREA LEVEL OF SERVICE CONDITIONS**

INTERSECTION	CONTROL	PEAK HOUR	EXISTING		EXISTING PLUS PROJECT	
			Density	LOS	Density	LOS
1 SOMERSVILLE ROAD & JAMES DONLON BOULEVARD	Highway Ramps	AM	24.5	C	24.7	C
		PM	22.4	C	22.4	C

**SOURCE:** Abrams Associates, 2019

**NOTES:** Density is presented in terms of passenger cars per mile per lane.

## 5.4 Baseline Traffic Capacity Conditions (Scenario 3)

The Baseline scenario evaluates the existing conditions with the addition of traffic from reasonably foreseeable projects in the area. As a worst case assumption the general baseline growth in traffic was developed based on the assumption that the project completion date would be 2021. This scenario includes one percent per year growth in background traffic for three years. No other approved projects were identified that would significantly alter the traffic volumes at the project study intersections. **Figure 5** presents the resulting baseline volumes at each of the project study intersections. **Table 5** summarizes the associated LOS computation results for the Baseline weekday AM and PM peak hour conditions. The corresponding LOS analysis calculation sheets are presented in the Technical Appendix to this report. As shown in **Table 5**, the ramp merge at the golf course entrance on State Route 4 is forecast to continue to have acceptable conditions (LOS D or better) during the weekday AM and PM peak hours.

**TABLE 5**  
**BASELINE AND BASELINE PLUS PROJECT RAMP MERGE AREA**  
**LEVEL OF SERVICE CONDITIONS**

INTERSECTION	PEAK HOUR	BASELINE		BASELINE PLUS PROJECT	
		Density	LOS	Density	LOS
Franklin Canyon Golf Course On-Ramp Merge With Eastbound SR 4	AM	25.3	C	25.4	C
	PM	23.1	C	23.1	C

**SOURCE:** Abrams Associates, 2019

**NOTES:** Density is presented in terms of passenger cars per mile per lane.

## 5.5 Baseline Plus Project Traffic Capacity Conditions (Scenario 4)

The Baseline plus proposed project traffic forecasts were developed by adding project-related traffic to the baseline traffic volumes. **Figure 5** presents the Baseline Plus Project traffic volumes that were used in the analysis. **Table 5** summarizes the LOS results for the Baseline and Baseline Plus Project weekday AM and PM peak hour conditions. Please note that the corresponding LOS analysis calculation sheets are presented in the technical appendix to this report. As shown in **Table 5**, the ramp merge at the existing golf course entrance on State Route 4 is forecast to continue to have acceptable conditions (LOS D or better) during the weekday AM and PM peak hours with the addition of traffic from the proposed project.



## 5.6 Cumulative Traffic Capacity Conditions (Scenario 5)

For the cumulative conditions, the intersection traffic volumes were based on the existing turning movements with the addition of traffic from all planned projects plus the addition of incremental growth in background traffic estimated by the County's traffic model for the area, which equates to one half percent per year to the year 2040. **Figure 6** presents the cumulative build-out traffic volumes for the project study intersections. **Table 6** summarizes the LOS results for the Cumulative (Year 2040) traffic conditions at each of the project study intersections. No other cumulative roadway improvements were assumed for the area. As shown on **Table 6**, the ramp merge at the golf course entrance on State Route 4 is forecast to continue to have acceptable conditions (LOS D or better) during the weekday AM and PM peak hours.

**TABLE 6**  
**CUMULATIVE AND CUMULATIVE PLUS PROJECT RAMP MERGE AREA**  
**LEVEL OF SERVICE CONDITIONS**

INTERSECTION	PEAK HOUR	CUMULATIVE		CUMULATIVE PLUS PROJECT	
		Density	LOS	Density	LOS
Franklin Canyon Golf Course On-Ramp Merge With Eastbound SR 4	AM	27.7	C	27.9	C
	PM	25.3	C	25.4	C

**SOURCE:** Abrams Associates, 2019

**NOTES:** Density is presented in terms of passenger cars per mile per lane.

## 5.7 Cumulative Plus Project Traffic Capacity Conditions (Scenario 6)

**Figure 6** presents the cumulative build-out traffic volumes including the traffic from the proposed commercial project. **Table 7** summarizes the LOS results for the Cumulative Plus Project (Year 2040) traffic conditions at each of the project study intersections. As shown on this table, the ramp merge at the existing golf course entrance on State Route 4 is forecast to continue to have acceptable conditions (LOS D or better) during the weekday AM and PM peak hours with the addition of traffic from the proposed project.

## 5.8 Internal Circulation and Access

No internal site circulation or access issues have been identified that would cause a traffic safety problem or any unusual traffic congestion or delay. At the project entrance there were no sight distance issues and no capacity problems were identified with the use of the existing golf course access. However, it should be noted that access to and from the site can be rather circuitous for motorists leaving the site and heading west on State Route 4. The nearest shopping is located to the west in Hercules but because there is no access to westbound State Route 4 at the site and motorists must first travel east. From the project site it is about 6.5 miles to shopping in Martinez. However, although the site is only about 3 miles from Hercules the circuitous route required to head westbound from the site means it's actually about a 6 mile drive. Again, this is because to head this direction (westbound) on State Route 4 from the site requires travelling east for about one and half miles to the Cummings Skyway interchange where a motorist can then access westbound State Route 4 to head back towards Hercules. A similar situation exists for motorists attempting to access the site from westbound State Route 4. When travelling westbound on State Route 4 a motorist must go about three quarters of a mile west of the site to the Franklin Canyon Road interchange. From there a motorist can exit





westbound State Route 4 to access the eastbound direction of the highway and the project entrance. It should also be noted there is a substantial uphill grade on eastbound State Route 4 between the site and the Cummings Skyway. However, vehicles exiting the site onto State Route 4 have an acceleration lane to safely merge with traffic before the hill. Because the speed limit is only 55 mph in this area any vehicles merging onto State Route 4 in this area typically have a minimal impact on the regular flow of traffic.

One potential safety benefit of the project would be through the potential to direct more park users to the trailhead proposed at the entrance to the project. Currently the main access and trailhead for the Fernandez Ranch Open Space is accessed via Christie Road. Christie Road appears to be a less desirable access point for the public to reach the open space, from a traffic safety perspective. This is because the intersection of Christie Road with State Route 4 has no acceleration or deceleration lanes provided and it is located right before the steepest part of the grade in this area where it can be difficult to find a gap to merge with traffic on State Route 4 during peak hours. It can also take a little longer for motorists to get up to the speed of traffic on State Route 4 before the adjacent uphill grade.

## **5.9 Parking Impacts**

The proposed project would provide an adequate supply of off-street parking based on the County's requirements. The project is currently proposing to meet the County's parking requirements. Subject to final County approval of the proposed parking plan there would be no significant parking impacts expected to the surrounding properties.

## **5.10 Pedestrian and Bicycle Impacts**

Employees and guests of the project could potentially generate a limited amount of additional pedestrian and bicycle traffic in the area, thereby potentially increasing conflicts between vehicles, bicycles, and pedestrians. However, the project would not conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks) or generate pedestrian, bicycle, or transit travel demand that would not be accommodated by transit, bicycle, or pedestrian facilities and plans. Based on our review there would be no significant impacts to bicycle or pedestrian safety in the area and no mitigations or improvements are recommended at this time.

## **5.11 Transit Impacts**

The proposed project would not interfere with any existing bus routes and would not remove or relocate any existing bus stops. The proposed Project could also potentially help support existing bus services with additional transit ridership and would not conflict with any transit plans or goals of the County or Westcat. Although the proposed project does have the potential to increase patronage on bus lines in the area, based on this analysis the project would not result in degradation of the level of service (or a significant increase in delay) on any roadway segments currently being utilized by bus transit in the area and, as such, no significant impacts to transit are expected. As a result, the project would not be expected to result in any significant impacts to transit service in the area.

## 5.12 Impacts to the State Route 4 Freeway

As noted previously, the delay index measures travel congestion and is expressed as the ratio of the time required to travel between two points during the peak hour (the congested travel time) and the time required during un-congested off-peak times. The denominator of the delay index formula, the measured peak hour travel time, was determined from speed runs conducted along State Route 4 during the AM and PM peak hours in the spring of 2017 as part of the Contra Costa Transportation Authority's Congestion Management Program (CMP) 2017 Monitoring Report.<sup>3</sup>

The numerator of the delay index formula, the free flow travel time is defined as *"the time it takes to traverse a roadway segment at the speed limit including the average uncongested delay experienced at traffic signals."* It is important to note that achievement of the MTSO delay index and average speed for the segment adjacent to the proposed project is measured from Interstate 80 to the Cummings Skyway. For this segment of State Route 4 the 2017 CMP Monitoring Report reported a delay index of 1.1 for both directions. Under cumulative (2040) conditions the West County Action Plan for Routes of Regional Significance indicates that the delay index on State Route 4 is forecast be 1.2 for both directions, which is within the 2.0 delay index standard established for this segment. It should also be noted the development of the proposed project would increase the total traffic on SR 4 during both AM and PM peak hours but the increase to any one segment is forecast to be less than one half of a percent and well under 50 trips per hour.

## 5.13 Recommended Mitigation Measures

The project would not cause any intersections in the study area to exceed County or Caltrans standards and no vehicular traffic mitigations would be required.

### Project-Specific Impacts and Mitigation Measures

The following is a list of potential transportation impacts of the project. With the implementation of the proposed measures described in this section, all project transportation impacts would be reduced to a less than significant level.

#### TR-1 Impacts related to pedestrian facilities.

The proposed project would generate additional pedestrian and bicycle traffic in the area, thereby potentially increasing conflicts between vehicles, bicycles, and pedestrians. Based on the County's significance criteria the project's impacts on pedestrian travel would be considered less than significant and no mitigations would be required.

#### Mitigation Measure(s)

*None required.*

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<sup>3</sup> Contra Costa Sub-Regional Action Plans for the Routes of Regional Significance Multimodal Traffic Service Objectives (MTSO) Draft 2017 Monitoring Report, Iteris, Inc., Santa Ana, CA, March, 2018

**TR-2 Impacts related to bicycle facilities.**

Although the proposed project would increase vehicle and pedestrian traffic in the project vicinity it is not expected to significantly impact or change the design of any existing bicycle facilities or create any new safety problems for bicyclists in the area.

Mitigation Measure(s)

*None required.*

**TR-3 Impacts related to transit facilities.**

The proposed project has the potential to increase patronage on bus lines in the area. However, based on this analysis the project would not result in degradation of the level of service (or a significant increase in delay) on any roadway segments currently being utilized by bus transit in the area and, as such, no significant impacts to transit are expected. The project contribution to key roadway segments in the area would not result in any significant changes to travel speeds. As a result, the project would not be expected to result in any significant impacts to transit service in the area.

Mitigation Measure(s)

*None required.*

**TR-4 Construction activities associated with the proposed project would result in an increase in traffic to and from the site and could lead to unsafe conditions near the project site.**

The increase in traffic as a result of construction activities associated with the proposed project has been quantified assuming a worst-case single phase construction period of 24 months.

*Heavy Equipment*

Approximately eight pieces of heavy equipment are estimated to be transported on and off the site each month throughout the construction of the proposed project. Heavy equipment transport to and from the site could cause traffic impacts in the vicinity of the project site during construction. However, each load would be required to obtain all necessary permits, which would include conditions. Prior to issuance of grading and building permits, the project applicant would be required to submit a Traffic Control Plan.

The requirements within the Traffic Control Plan include, but are not limited to, the following: truck drivers would be notified of and required to use the most direct route between the site and the freeway, as determined by the County Engineering Department; all site ingress and egress would occur only at the main driveways to the project site and construction activities may require installation of temporary (or ultimate) traffic signals as determined by the County Engineer; specifically designated travel routes for large vehicles would be monitored and controlled by flaggers for large construction vehicle ingress and egress; warning signs indicating frequent truck entry and exit would be posted on adjacent roads; and any debris and mud on nearby streets caused by trucks would be monitored daily and may require instituting a street cleaning program. In addition, eight loads of heavy equipment being hauled to and from the site each month would be short-term and temporary.

### *Employees*

The weekday work is expected to begin around 7:00 AM and end around 4:00 PM. The construction worker arrival peak would occur between 6:30 AM and 7:30 AM, and the departure peak would occur between 4:00 PM and 5:00 PM. It should be noted that the number of trips generated during construction would not only be temporary, but should also be less than the proposed project trip generation at buildout. Based on past construction of similar projects, construction workers could require parking for up to 40 vehicles during the peak construction period. Additionally, deliveries, visits, and other activities may generate peak non-worker parking demand of 10 to 20 trucks and automobiles per day. Therefore, up to 60 vehicle parking spaces may be required during the peak construction period just for the construction employees. Furthermore, the Traffic Control Plan will require construction employee parking be provided on the project site or in off-site parking lots to eliminate conflicts with nearby residential areas. The construction of the project can also be staggered so that employee parking demand can be met by using on-site parking. Therefore, the impacts of construction-related employee traffic and parking are considered less-than-significant.

### *Construction Material Import*

The project would also require the importation of construction material, including raw materials for the building pads, the buildings, the parking areas, and landscaping. Under the provisions of the Traffic Control Plan, if importation and exportation of material becomes a traffic nuisance, then the County Engineer may limit the hours the activities can take place.

### *Traffic Control Plan*

The Traffic Control Plan would indicate how parking for construction workers would be provided during construction and ensure a safe flow of traffic in the project area during construction. This analysis assumed construction of the entire project in one phase to identify the potential worst-case traffic effects. If the project is built in phases over time, the effects of each phase will be the same or less. Each phase will be subject to a Traffic Control Plan and oversight by the County Engineer. The last phase may require added worker parking measures, depending on the circumstances, as there will not be any remaining vacant land for parking. Therefore, the construction activities associated with the proposed project or its individual phases would not lead to noticeable congestion in the vicinity of the site or the perception of decreased traffic safety resulting in a ***less-than-significant*** impact.

### Mitigation Measure(s)

*None required.*

## **TR-5 Impacts to freeway operations.**

The development of the proposed project would increase the total traffic on SR 4 during both AM and PM peak hours but the increase to any one segment is forecast to be less than one half of a percent and well under 50 trips per hour. As described in Section 5.12, the project also would not conflict with any standards established by the county congestion management agency (the CCTA) and therefore the proposed project would have a ***less-than-significant*** impact to freeway operations.

### Mitigation Measure(s)

*None required.*



**TR-6 Impacts related to site access and circulation.**

The proposed project would have one unsignalized driveway and one secondary access for emergency vehicles only. Based on a review of the proposed site plan it was determined that the site circulation should function well and would not cause any safety or operational problems. The project site design has been required to conform to County design standards and the plan is not expected to create any significant impacts to pedestrians, bicyclists or traffic operations. Therefore, impacts related to site access and circulation to the proposed project would be ***less-than-significant***.

Mitigation Measure(s)

*None required.*

**TR-7 Impacts regarding emergency vehicle access on and surrounding the proposed project site.**

Sufficient emergency access is determined by factors such as number of access points, roadway width, and proximity to fire stations. The land use plan for the proposed project includes a primary entrance onto State Route 4 along with secondary entrance onto Christie Road for emergency vehicles only. All lane widths within the project should meet the minimum width that can accommodate emergency vehicles and the final emergency vehicle access plan would be subject to final approval from the Fire Department. Therefore, the development of the proposed project is expected to have ***less-than-significant*** impacts regarding emergency vehicle access.

Mitigation Measure(s)

*None required.*