



PUBLIC WORKS
ENGINEERING SERVICES DIVISION
INTEROFFICE MEMORANDUM

DATE: August 8, 2019

TO: Lisa Bobadilla, Division Manager
Lauren Barr, Division Manager
Cindy Yee, AICP, Senior Planner
Deborah Fehr, PE, Senior Engineer

FROM: Theresa Peterson, Associate Engineer

CC: Robin Bartlett, PE, GE, District Engineer/Division Manager

SUBJECT: Final Addendum to the Initial Study/Mitigated Negative Declaration for the Bollinger Canyon Road/Iron Horse Trail and Crow Canyon Road/Iron Horse Trail Bicycle and Pedestrian Overcrossing Projects
(CIP 905530 and CIP 5531)

Thank you for your participation in the development of the attached Final Addendum to the Initial Study/Mitigated Negative Declaration for the Bollinger Canyon Road/Iron Horse Trail and Crow Canyon Road/Iron Horse Trail Bicycle and Pedestrian Overcrossing Projects, dated August 8, 2019. This final document will be placed in the Project file for future reference.



CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: August 8, 2019

To: Theresa Peterson, City of San Ramon

FROM: Theresa Wallace, AICP Principal
Shanna Guiler, AICP, Associate/Senior Environmental Planner

SUBJECT: Final Addendum to the Initial Study/Mitigated Negative Declaration for the San Ramon Iron Horse Trail Overcrossings Project (SCH# 2017082088)

This memorandum, prepared pursuant to the California Environmental Quality Act (CEQA) describes the revisions to the San Ramon Iron Horse Trail Overcrossings Project (proposed project) evaluated in the January 2018 Final Initial Study/Mitigated Negative Declaration (Final IS/MND) and provides a determination that the modifications to the project are within the scope of the Final IS/MND and no further environmental review is required. The Final IS/MND was adopted by the City of San Ramon City Council on November 28, 2017 (Resolution No. – 2017-129).

INTRODUCTION

The Final IS/MND evaluated the potential environmental impacts anticipated to result from construction and operation of the proposed project, which is part of the City of San Ramon's Capital Improvement Program (Projects 905530 and 5531). The purpose of the proposed project is to improve access and safety for bicyclists and pedestrians along the Iron Horse Regional Trail (Iron Horse Trail) and to create a more bicycle/pedestrian-friendly environment at the Crow Canyon Road and Bollinger Canyon Road crossings within the City of San Ramon. The proposed project would construct new overcrossings generally along the existing alignment of the Iron Horse Trail, where it intersects with Crow Canyon Road and Bollinger Canyon Road. As such, the Final IS/MND analyzed the environmental impacts associated with development of a new overcrossing at both locations, individually referred to as the "Crow Canyon site" and the "Bollinger Canyon site" or collectively as the "project sites." The project sites are under the jurisdiction of multiple local and regional agencies, including the City of San Ramon (City), County of Contra Costa (County), and the East Bay Regional Park District (EBRPD). The City of San Ramon is the Lead Agency for CEQA environmental review while the County and EBRPD serve as Responsible Agencies¹ for the proposed project.

This Addendum is prepared pursuant to CEQA Guidelines Section 15164(b) which states: "An addendum to an adopted negative declaration may be prepared if only minor technical changes or additions are necessary or none of the conditions described in Section 15162 calling for preparation

¹ A "Responsible Agency" is any public agency, other than the lead agency, which has the responsibility for approving the project where more than one public agency is involved.

of a subsequent EIR or negative declaration have occurred” Section 15162 specifies that “no subsequent EIR [or MND] shall be prepared for that project unless the lead agency determines ... one or more of the following:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR [or MND] due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR [or MND] due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR [or MND] was certified as complete was adopted, shows any of the following:
 - a. The project will have one or more significant effects not discussed in the previous EIR [or MND];
 - b. Significant effects previously examined will be substantially more severe than shown in the previous EIR [or MND];
 - c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
 - d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR [or MND] would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.”

Pursuant to CEQA Guidelines Section 15164(e), this Addendum summarizes the changes to the proposed project evaluated in the Final IS/MND and the reasons for the City’s conclusion that changes to the proposed project and associated environmental effects do not meet the conditions described in CEQA Guidelines Section 15162 requiring preparation of a subsequent MND.

REVISED PROJECT

Since adoption of the Final IS/MND and approval of the proposed project on November 28, 2017, the City has refined the design for the Bollinger Canyon overcrossing to include a shorter cable stay bridge with a central support. The central support would require slight modifications to the overall bridge design and the elimination of the existing left turn lane on Bollinger Canyon Road. The description of the proposed Bollinger Canyon Road overcrossing as included in the Final IS/MND (pages 14 through 20) is shown below and revised as follows (revised text shown in underline and ~~strikeout~~). The proposed project, as modified, constitutes the “Revised Project.”

2. Bollinger Canyon Overcrossing

At this location, the proposed overcrossing would serve to link key destination areas of San Ramon and the region, including the partially opened future City Center and Bishop Ranch Business Park. The bridge would also provide a link via the Iron Horse Trail between the City's Central Park, City Hall, Library, Transit Center and connectivity to Iron Horse Middle School. At this location, the bridge would be aligned between the existing light rail transit corridor to the east and a storm drain easement to the west. The trail on the northern end of the bridge would require minor realignment to connect to the bridge ramp. ~~The conceptual footprint for the proposed overcrossing, including areas of temporary disturbance and the area that would comprise the total bridge footprint, is depicted in Figure 8. Figures 9 and 10 1 through 3 depict two the proposed site plan, conceptual bridge designs and alignments cross sections.~~ Individual components of the Bollinger Canyon overcrossing are detailed below.

a. Configuration and Design. The Bollinger Canyon overcrossing would likely consist of a cable-stayed main span with a single central support tower located on the south side of Bollinger Canyon Road or a design of similar appearance. ~~Two options are considered for the preliminary conceptual tower design: a single mast (Figure 9) or an A frame (Figure 10).~~ From the northern to southern landings, the total length of the new overcrossing would be ~~between~~ approximately 950 933 linear feet to ensure ADA compliance. The width of the span would range between approximately 16 and 20 feet.

Based on the preliminary conceptual bridge designs, the northern approach would consist of Mechanically Stabilized Earth (MSE) retaining walls and an aerial approach structure supported by columns. The retaining wall would be up to 20 feet high at the aerial structure abutment. The aerial approach structure would be either a concrete girder or a steel girder structure. Following the widening at Bollinger Canyon Road, the proposed cable-stayed span would cross over the existing future 114-foot-wide roadway (curb to curb) and a ~~back span~~ would be connected to the southern approach. The southern approach would consist of MSE retaining walls that would be up to approximately 20 feet high at the cable-stayed bridge abutment. All approaches would have a continuous slope of less than 5 percent in accordance with ADA standards.

Back span cColumn supports could be made of concrete and would range from 3 to 6 feet in diameter at the base and between 10 and 19 feet tall. The columns could be supported by pile groups or drilled shafts. The top of pile caps or drilled shafts would be at least 2 feet below ground. The minimum vertical clearance of the bridge superstructure would be approximately 17 feet and the height would be approximately 24 feet from the existing grade. The tower component would be a maximum of approximately ~~135~~ 70 feet tall. Depending on the width of the overcrossing determined through the final design, the path could consist of shared or separated bike and pedestrian/~~equestrian~~ travel lanes. Guardrails would be located on the length of the pathway and would be a minimum height of 4 feet tall. Lighting may also be installed along the length of the overcrossing; specific lighting standards and maintenance requirements would be developed as part of the final design phase.

b. Access and Circulation. As previously discussed, the existing crossing at Bollinger Canyon Road aligns with a cross street at a T-intersection. With development of the bicycle/pedestrian bridge, the

existing traffic signal would remain to accommodate vehicular traffic at the intersection; however, the existing left turn lane on westbound Bollinger Canyon Road would be removed to accommodate the bridge central support. Removal of the left turn lane is not expected to have a significant impact on service levels based on results of the traffic analysis conducted by the City of San Ramon. In addition, the existing pedestrian crosswalk would be removed. Approximately ~~600~~900 feet of the existing trail would be realigned to accommodate the approach on the northern touchdown and approximately 600 feet would be realigned to accommodate the approach on the southern touchdown.

c. Utilities and Infrastructure. Multiple subsurface utility lines are located within the 100-foot-wide Iron Horse Trail easement at the Bollinger Canyon site and within or near the proposed alignment for the overcrossing. Utilities described herein are based upon known utility easement information; however, a detailed ground survey would be required prior to construction to confirm the size, location, and depth of all utility lines. Further coordination with all relevant agencies would be required prior to construction, in order to confirm the relocation or protection-in-place of all existing utility lines as required. Ultimately, the timing and need for temporary construction easements to accommodate utility relocation would be determined with and agreed to by the City, property owners, and service providers during the final project design process.

Based on the utility easement information available from previous studies, the following is a list of all utilities within the trail easement and considerations for how each may be addressed to allow implementation of the proposed project:

- A 10-inch diameter high pressure refined petroleum products pipeline operated by Kinder-Morgan is located within a 5-foot-wide easement on the eastern edge of the trail easement. This utility line falls on the eastern side of the projected footprint and is not anticipated to require relocation. Once the depth and precise location of the pipeline is determined, the pipeline would be protected-in-place as required;
- The Central Contra Costa Sanitary District maintains a 12-foot-wide sewer easement and one 24-inch diameter sewer line is located within the easement. This sewer line would need to be relocated in locations where there is a conflict with the bridge foundations. In other locations, it would be protected-in-place;
- A fiber optic cable operated by Time Warner runs on the west side of the trail easement north of Bollinger Canyon Road and on the east side of the trail easement south of Bollinger Canyon Road. This utility line would need to be relocated in locations where there is a conflict with the bridge foundations. In other locations, it would be protected-in-place;
- A 16-inch diameter Dublin San Ramon Services District/East Bay Municipal Utilities District (EBMUD) Recycled Water Authority (DERWA) recycled water pipe is also located south of Bollinger Canyon Road near the center of the trail corridor. This pipe would need to be relocated in locations where there is a conflict with the bridge foundations. In other locations, it would be protected-in-place;

- Underground utility lines (including electrical, gas and water) run parallel to the trail easement and on the west side of the Kinder-Morgan petroleum pipeline. These utility lines fall outside the bridge conceptual footprint and are not expected to require relocation. The exact location of these utilities should be reviewed in case the extent of the project footprint is modified in a future phase of the design or construction;
- A 12-Kv overhead electrical line operated by PG&E is located parallel to the trail easement and on the west side of the Kinder-Morgan petroleum pipeline. This utility line is not anticipated to require relocation and would be protected in place;
- The underground electrical, gas, telephone, fiber optic, and water lines running parallel to Bollinger Canyon Road may be protected-in-place at the intersection with the trail easement as required.
- Contra Costa County maintains a 34-foot wide light rail corridor/easement in the center of the trail corridor. This easement is located adjacent to the existing paved trail north of Bollinger Canyon Road. South of Bollinger Canyon Road, both the light rail easement and the existing path coincide in the center of the trail easement. The light rail easement overlaps with the projected footprint of the overcrossing along its entire length.
- The City of San Ramon owns and operates a traffic signal system on Bollinger Canyon Road on the south side of the Iron Horse Regional Trail. A portion of the signal equipment is located inside the trail property but within an existing signal easement. The proposed overcrossing will span over this easement.

The surface of the proposed Bollinger Canyon overcrossing would have a minimum cross slope of 1 percent for proper drainage. The design would comply with the City's standards regarding concepts for stormwater planters and bioswales. C.3 water treatment features would be installed in the vicinity of the overcrossings or at another appropriate off-site location.

d. Construction. The total area of disturbance for construction of the Bollinger Canyon overcrossing would be approximately 4.4 acres. Of this, about 1.4 acres would consist of temporary disturbance during the construction period and these areas would be restored upon project completion. The maximum depth of excavation for the bridge footings and landing area would be about 10 feet. Column foundations could be either multiple small diameter piles or large diameter drilled shafts.

The cable-stayed bridge would be constructed of either steel or concrete. With a concrete bridge deck, the edge beams and the slabs would be constructed on falsework over the existing street. In accordance with Caltrans Bridge Design Aids, a temporary traffic opening with 14-foot minimum vertical clearance would be provided during construction of the arch. With a steel structure, the steel deck would be fabricated off-site, transported to the site and erected into position. Temporary shoring on the sides of the existing street would be used during erection. Falsework would not be required for this construction method.

The approaches to the bridges would be constructed of steel, concrete, or on retaining walls. With a steel structure, the approach bridges would be transported to the site and erected into position. Falsework would not be necessary. With a concrete structure, the structure would likely be constructed on falsework with the cast-in-place method.

~~For the wall approaches, MSE walls or concrete retaining walls could be used.~~

During construction, an approximately 15-foot-wide easement along the west side of the bridge would be required for construction access. An approximately 95-foot by 200-foot staging area would be required at the beginning and end of the overcrossing.

Based on the approximate area of temporary disturbance and conceptual overcrossing designs, approximately 3,888 cubic yards of soil would be collected and may be off-hauled by the construction contractor to an approved facility. The construction period would occur for a duration of approximately two years. During the construction period, trail users would likely be detoured depending on the final alignment of the pedestrian crossing. Falsework may also be used for the construction of the pedestrian overcrossing. A reduced traffic opening may be provided to allow bi-directional traffic on Bollinger Canyon Road during construction and traffic would be detoured to side streets to reduce congestion. Some night and weekend road closures may be required for putting up falsework, tower construction and/or deck installation. If road closures are needed, traffic would be detoured. Detours would be signed and notification provided to emergency service providers, as appropriate.

Final details regarding trail and roadway operations during the construction phase and location and size of temporary construction easements and staging areas would be identified during final project design. The City, County, and EBRPD would collaborate to develop and approve of the transportation/traffic management and construction design plans prior to commencement of construction activities. The final design and construction phases would take place when funding is secured.

COMPARISON TO THE CONDITIONS LISTED IN CEQA GUIDELINES SECTION 15162

Aesthetics

Section I of the Final IS/MND analyzed the visual conditions of the project area. Similar to the proposed project, the Revised Project would not substantially impact a scenic vista nor would it substantially damage scenic resources within a State scenic highway. As part of the Revised Project, the Bollinger Canyon overcrossing would be modified to include a shorter cable stay bridge with a lower central support. Although the Revised Project would result in modifications to the bridge design, the overall size and mass of the proposed overcrossing would be smaller and the tower structure shorter than that evaluated in the Final IS/MND. Similar to the proposed project, the overcrossing would be designed to blend in and enhance the visual character of the trail and surrounding area. Therefore, the Revised Project would not have a substantial effect on scenic vistas or existing visual resources nor would it degrade the existing visual character or quality of the site. Similar to the proposed project, the Revised Project would provide lighting along the entire length of the overcrossing, resulting in a new source of light in the project area. Implementation of Mitigation Measure AES-1, identified in the Final IS/MND would ensure that impacts related to light and glare

would be reduced to less than significant levels. ***No new impacts would occur and no additional mitigation measures are required.***

Agricultural Resources

Section II of the Final IS/MND analyzed impacts to agricultural resources. No impacts to agricultural resources were identified in the IS/MND. Similar to the proposed project, the Revised Project would not result in the conversion of agricultural land nor would it conflict with existing zoning for agricultural use or Williamson Act contract. ***No new impacts would occur.***

Air Quality

Section III of the Final IS/MND analyzed impacts to air quality. The IS/MND identified temporary short-term, construction-related impacts to air quality. No long-term operational impacts were identified. Similar to the proposed project, the Revised Project would not conflict with or obstruct implementation of the applicable air quality plan, violate air quality standards, or result in a cumulatively considerable net increase in any criteria pollutant. Construction of the Revised Project would utilize similar construction techniques identified in the Final IS/MND; therefore, no additional impacts or increase in the severity of air quality impacts would occur with implementation of the Revised Project. Implementation of Mitigation Measure AIR-1, identified in the Final IS/MND would ensure that impacts related to air quality would be reduced to less than significant levels. ***No new impacts would occur and no additional mitigation measures are required.***

Biological Resources

Section IV of the Final IS/MND analyzed impacts to biological resources associated with implementation of the proposed project. The Final IS/MND identified areas of potential impact, including adverse effects on special-status species, sensitive natural communities, locally significant species, and wetlands. The Revised Project would be located within the same area as the proposed project and would be subject to similar biological conditions. Therefore, impacts to biological resources would be similar to those analyzed for the proposed project in the Final IS/MND. Implementation of Mitigation Measures BIO-1, BIO-2, BIO-3, BIO-4, and BIO-5 identified in the Final IS/MND would ensure that impacts would be reduced to less than significant levels. ***No new impacts would occur and no additional mitigation measures are required.***

Cultural Resources

Section V of the 2005 IS/MND analyzed impacts to cultural resources associated with implementation of the proposed project. The IS/MND identified potential impacts to previously unidentified archaeological and paleontological deposits as a result of ground disturbing activities. The Revised Project would require slight modifications to the bridge design, including the approaches and connections to the existing trail alignment. However, the Revised Project would not impact any known or previously identified cultural resources. Similar to the proposed project, the Revised Project has the potential to encounter unidentified cultural deposits during construction activities. Implementation of Mitigation Measures CULT-1, CULT-2, and CULT-3 identified in the Final IS/MND would ensure that impacts would be reduced to less than significant levels. ***No new impacts would occur and no additional mitigation measures are required.***

Energy

Since adoption of the Final IS/MND, the CEQA Checklist has been updated to include a discussion of potential project impacts related to energy. As energy was not addressed were not evaluated in the Final IS/MND, the Revised Project's potential to result in a potentially significant environmental impact due to wasteful, inefficient or unnecessary consumption of energy resources or to conflict with or obstruct a state or local plan for renewable energy or energy efficiency is described below.

Construction of the Revised Project would require the use of energy to fuel grading vehicles, trucks, and other construction vehicles. All or most of this energy would be derived from non-renewable resources. In order to increase energy efficiency on the site during project construction, the project would restrict equipment idling times to 5 minutes or less and would require construction workers to shut off idle equipment, as required by the BAAQMD's Basic Construction Mitigation Measures (Mitigation Measure AIR-1, identified in the Final IS/MND). In addition, construction activities are not anticipated to result in an inefficient use of energy as gasoline and diesel fuel would be supplied by construction contractors who would conserve the use of their supplies to minimize their costs on the project. Energy usage on the project site during construction would be temporary in nature and would be relatively small in comparison to the State's available energy sources. Therefore, construction energy impacts would be less than significant.

Typically, energy consumption is associated with fuel used for vehicle trips and natural gas and energy use. However, the proposed project would construct pedestrian and bicycle overcrossings along the existing Iron Horse Trail alignment. Although the Revised Project would require the elimination of the existing left turn lane on Bollinger Canyon Road, elimination of this lane is not anticipated to affect vehicular circulation along the roadway. Vehicles using the roadway would continue to consume energy. However, approximately the same number of vehicles would utilize this road segment as in the current condition. Further, the Revised Project includes pedestrian and bicycle safety improvements to promote the use of alternative modes of transportation, which allow for a decreased dependence on nonrenewable energy resources. Operation of the Revised Project would not require the consumption of natural gas. Therefore, energy use consumed by the Revised Project would only be associated with minimal electricity consumption associated with lighting along the overcrossing. Therefore, implementation of the Revised Project would not result in a long-term substantial demand for electricity and natural gas nor would the project require new service connections or construction of new off-site service lines or substations to serve the project. The nature of proposed improvements would not require substantial amounts of energy for either construction or maintenance purposes. Therefore, the Revised Project would not use non-renewable resources in a wasteful or inefficient manner.

As indicated above, energy usage on the project site during construction would be temporary in nature. In addition, energy usage associated with operation of the proposed project would be relatively small in comparison to the State's available energy sources and energy impacts would be negligible at the regional level. Because California's energy conservation planning actions are conducted at a regional level, and because the project's total impact to regional energy supplies would be minor, the Revised Project would not conflict with California's energy conservation plans as described in the CEC's 2017 Integrated Energy Policy Report. Further, the Revised Project includes pedestrian and bicycle safety improvements to promote the use of alternative modes of

transportation, which allow for a decreased dependence on nonrenewable energy resources. Thus, as shown above, the Revised Project would avoid or reduce the inefficient, wasteful, and unnecessary consumption of energy and not result in any irreversible or irretrievable commitments of energy. Impacts would be less than significant. ***No new impacts would occur and no additional mitigation measures are required.***

Geology and Soils

Section VI of the Final IS/MND analyzed the geological, seismic, and soil conditions within the project area. The Final IS/MND identified areas of potential impact, including damage due to seismic ground shaking, seismic-related liquefaction, soil erosion, and expansive soils. Construction of the Revised Project would occur in the same vicinity as the proposed project and would be subject to similar geological and soil conditions. No additional impacts or increase in the severity of impacts would occur with implementation of the Revised Project. Like the proposed project, the Revised Project would be developed in conformance with the Caltrans Bridge Design Guidelines and Criteria and the recommendations of the project-specific soils report (as required by the City). Compliance with these regulatory requirements would ensure that potential impacts related to geology and soils would be reduced to less than significant levels. ***No new impacts would occur and no additional mitigation measures are required.***

Greenhouse Gas Emissions

Section VII of the Final IS/MND analyzed impacts associated with global climate change and greenhouse gas (GHG) emissions resulting from the implementation of the proposed project. No potentially significant GHG impacts were identified. Similar to the proposed project, the Revised Project would not generate GHG emissions, either directly or indirectly that would have a significant impact on the environment or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. ***No new impacts or increase in severity of impacts would occur.***

Hazards and Hazardous Materials

Section VIII of the Final IS/MND analyzed impacts related to hazards and hazardous materials that would be associated with implementation of the proposed project. The Final IS/MND identified potential impacts related to transport, handling, and disposal of potentially contaminated soil and/or groundwater during excavation and grading activities at the site. The Revised Project would use similar construction techniques identified for the proposed project and would be subject to the same conditions with respect to hazards. Implementation of Mitigation Measure HAZ-1 identified in the Final IS/MND would reduce impacts associated with hazards and hazardous materials to less than significant levels. ***No new impacts would occur and no additional mitigation measures are required.***

Hydrology and Water Quality

Section IX of the Final IS/MND analyzed impacts to hydrology and water quality associated with implementation of proposed project. The Final IS/MND determined that the proposed project would have a less than significant effect on water quality standards and waste discharge requirements. Although the proposed project would introduce an incremental increase in impervious surfaces in

the form of the overcrossings, stormwater would generally drain into landscaped and other pervious areas on either side of the trail. Similar to the proposed project, the Revised Project would not substantially increase runoff from the project site during storm events as stormwater would percolate into the unpaved portions of the project site. Further, like the proposed project, the Revised Project would be required to meet the terms of Provision C.3 of the Municipal Regional Stormwater Permit, which requires implementation of appropriate source control, site design and stormwater treatment measures for new development and redevelopment projects. Like the proposed project, the Revised Project would not require the use or extraction of groundwater.

Similar to the proposed project, the Revised Project would not alter the course of a stream or river within the project site, or involve extensive earth-shaping operations or other activities that would alter the existing drainage or flooding pattern of the site. The project is not located within a 100-year flood hazard area; therefore, like the proposed project, localized flooding within the Revised Project site would not expose people or structures to a significant risk of loss, injury or death.

The Final IS/MND determined that construction activities associated with the proposed project could result in soil erosion that could adversely affect water quality. The Revised Project would occur in the same vicinity as the proposed project using largely similar construction techniques and would be subject to the same hydrological conditions. Like the proposed project, the Revised Project would be required to comply with the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activity (Construction General Permit) and the City of San Ramon Municipal Code (Division B6, Chapter XII). In addition, the construction contractor would be required to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) designed to reduce potential impacts to surface water quality through the construction of and life of the project. Compliance with the terms of the SWPPP and other Municipal Code requirements related to stormwater and water quality would ensure that potential impacts to water quality would be less than significant. ***No new impacts or increase in severity of impacts would occur.***

Land Use

Section X of the Final IS/MND analyzed impacts to land use and planning associated with implementation of the proposed project. The Revised Project would be constructed in the same vicinity as the proposed project and would be subject to the same land use plans discussed in the Final IS/MND, including the City of San Ramon General Plan. Similar to the proposed project, the Revised Project would not physically divide an established community or conflict with a habitat conservation plan or natural community conservation plan. The Revised Project, similar to the proposed project, is consistent with the goals and policies contained in the San Ramon General Plan, the North Camino Ramon Specific Plan, and the City of San Ramon Zoning Ordinance. Furthermore, the Revised Project would not change the City land use or zoning designations in the project area and is compatible with existing land uses along the alignment. ***No new impacts or increase in severity of impacts would occur.***

Mineral Resources

No impacts to mineral resources were identified in the Final IS/MND. Similar to the proposed project, the Revised Project would not result in the loss of availability of a known mineral resource or a locally-important mineral resource recovery site. ***No new impacts would occur.***

Noise

Section XII of the Final IS/MND analyzed noise impacts associated with the proposed project. The IS/MND identified two potential temporary, short-term, construction-related noise impacts that would occur during construction: 1) noise generated by construction crew commutes and transportation of construction equipment and materials to the project site; and 2) noise generated by construction equipment on the project site. Construction period noise would be short-term and intermittent and subject to measures that restrict the hours of construction and impose maintenance and operation restrictions on construction equipment. Construction of the Revised Project would occur in the same vicinity using similar construction techniques. Implementation of Mitigation Measure NOISE-1 would reduce impacts to less than significant levels. ***No new impacts would occur and no additional mitigation measures are required.***

Population and Housing

Section XIII of the Final IS/MND analyzed impacts to population and housing associated with the proposed project. No impacts to population and housing were identified in the Final IS/MND. Similar to the proposed project, the Revised Project would not induce substantial growth, displace any existing housing units or people, and would not necessitate the construction of replacement housing elsewhere. ***No new impact or severity of impacts would occur.***

Public Services

Section XIV of the Final IS/MND analyzed impacts to public services associated with the proposed project. No significant impacts were identified. Similar to the proposed project, the Revised Project would not require the construction of new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance standards for fire protection, police protection, schools, parks, or other public facilities. Public services impacts would be less than significant. ***No new impacts or increase in severity of impacts would occur; and no mitigation measures are required.***

Recreation

Section XV of the Final IS/MND analyzed impacts to recreation associated with the proposed project. No significant impacts were identified. During construction, trail users would likely be detoured depending on the final alignment of the overcrossing. Temporary disturbance of the trail would be localized and cease once construction in this area is complete; therefore, temporary impacts would not be significant. Similar to the proposed project, the Revised Project would not increase the use of existing recreational facilities, nor would it create a need for additional recreation services. ***No new impacts would occur.***

Transportation

Section XVI of the Final IS/MND analyzed impacts to transportation/traffic associated with the proposed project. The IS/MND identified temporary impacts during project construction including lane closures/detours and the generation of additional traffic volumes. Construction of the Revised Project would be located in the same location as the proposed project and would use similar construction techniques that could create traffic impacts during construction. Like the proposed project, construction activities associated with the Revised Project would be conducted between the

hours of 7:30 a.m. and 7:00 p.m., Monday through Friday and between the hours of 9:00 a.m. and 6:00 p.m. on Saturdays and Sunday expect when traffic or safety warrant alternate hours. In addition, the City would require the submittal of a transportation demand management (TDM) plan for construction workers prior to the commencement of construction activities. Temporary lane closures could occur during various periods for putting up falsework, tower construction and/or deck installation. If needed, temporary detours would be developed. Like the proposed project, the Revised Project would not generate more than 50 or more peak hour vehicle trips during the construction period. Therefore, construction traffic on the adjacent roadways would not be significant.

Unlike the proposed project, the Revised Project would require the removal of the existing left turn lane on westbound Bollinger Canyon Road in order to accommodate the bridge central support. In addition, potential traffic signal timing adjustments may be implemented. A New Bridge Concept Elimination of Left Turn Lane Analysis Memorandum (Traffic Analysis Memo) (City of San Ramon Public Works, May 2019) was prepared for the Revised Project to analyze the traffic impacts of eliminating the existing left turn lane on westbound Bollinger Canyon Road. The Traffic Analysis Memo is provided as an attachment to this memorandum.

As stated in the Traffic Analysis Memo, since the Revised Project would eliminate the westbound left turn lane at the Bollinger Canyon Road/Bishop Ranch 1 East intersection, it is assumed that the westbound left turn volumes from Bollinger Canyon Road/Bishop Ranch 1 East would use the westbound left turn at the Bollinger Canyon Road/Camino Ramon intersection since they both serve the same parcel. Therefore, the Bollinger Canyon Road/Bishop Ranch 1 East westbound left turn volumes were added to the left turn volumes at the Bollinger Canyon Road/Camino Ramon intersection. The resulting LOS and delay for the intersection of Bollinger Canyon Road and Camino Ramon is shown in Table A below. The City requires a LOS of D or better. The intersection is expected to operate at acceptable level of service with the redistribution of the westbound left turn lane volumes from Bollinger Canyon Road/Bishop Ranch 1 East to the westbound left turn at the intersection of Bollinger Canyon /Camino Ramon. Therefore, traffic impacts associated with the removal of the existing left turn lane from westbound Bollinger Canyon Road would be less than significant.

Table A: Intersection Level of Service Analysis Results

| Analysis Period | LOS | Control Delay |
|-----------------|-----|---------------|
| AM Peak | D | 47.8 |
| PM Peak | D | 52.4 |

Source: City of San Ramon Public Works Department, 2019

Like the proposed project, the Revised Project is intended to improve access and safety; improve motor vehicle circulation; and to create better access and a more pedestrian-friendly environment at the two major arterial crossings.

Intersection modifications needed to accommodate the Revised Project, as described in this Addendum, would not result in significant traffic impacts, and all temporary construction impacts

would be less than significant. ***No new impacts or increase in severity of impacts would occur; and no mitigation measures are required.***

Tribal Cultural Resources

Section XVII of the Final IS/MND analyzed impacts to tribal cultural resources associated with the proposed project. No significant impacts to tribal resources were identified. The CEQA process requires consultation with Native Americans under Assembly Bill (AB) 52. As stated in the Final IS/MND, the City of San Ramon invited interested Native American tribes that may be culturally or traditionally affiliated with the project site to conduct consultation. Implementation of Mitigation Measures CULT-1 and CULT-3 identified in the Final IS/MND would reduce any potential impacts to tribal cultural resources. ***No new impacts would occur and no additional mitigation measures are required.***

Utilities and Service Systems

Section XVIII of the Final IS/MND analyzed impacts to utilities and service systems associated with the proposed project. No potentially significant impacts were identified in the Final IS/MND. Similar to the proposed project, the Revised Project would not result in increased growth that would exceed wastewater treatment requirements, require the construction of new/expansion of existing water or wastewater treatment facilities, result in the construction or expansion of storm water drainage facilities, or generate substantial amounts of solid waste that would exceed landfill capacity. As outlined in the project description, the size, location and depth of all utility lines would need to be confirmed prior to construction. Further coordination with all relevant agencies would be required to confirm the relocation or protection-in-place of all existing utility lines, as required. Any utility relocation would occur within the area of temporary disturbance and no new impacts would result beyond those already identified in the Final IS/MND and in this Addendum. ***No new impacts or increase in severity of impacts would occur; and no mitigation measures would be required.***

Wildfire

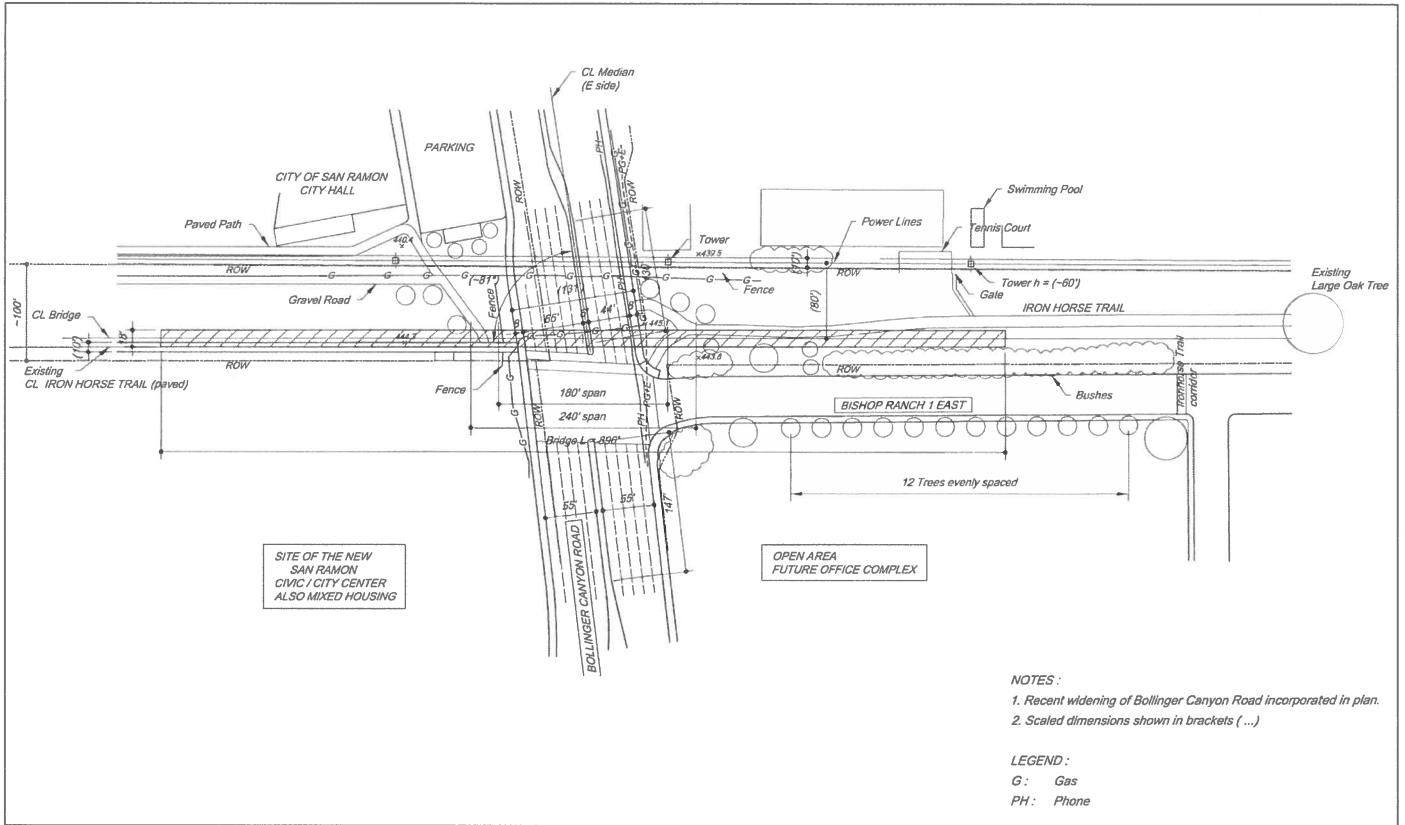
Risks associated with wildfire were evaluate in Section VIII, Hazards and Hazardous Materials, of the Final IS/MND. Like the proposed project, the Revised Project is not located within a fire hazard severity zone and is located within Built and Planned Urban Land. The Revised Project would develop pedestrian/bicycle overcrossings at Crow Canyon Road and Bollinger Canyon Road within existing rights-of-way. It would not introduce inappropriate uses or materials such as housing or a large amounts of fire-susceptible vegetation to the site that would increase the risk of wildland fire. ***No new impacts or increase in severity of impacts would occur; and no mitigation measures would be required.***

CONCLUSION

On the basis of the evaluation presented above, the Revised Project, if implemented, would not trigger any of the conditions listed under the CEQA Framework for Addendum section of this Addendum, requiring preparation of a subsequent or supplemental EIR. Thus, this Addendum satisfies the requirements of CEQA Guidelines Section 15162 and 15164. The changes to the Bollinger Canyon overcrossing design would not introduce new significant environmental effects, substantially increase the severity of previously identified significant environmental effects, or

demonstrate that mitigation measures or alternatives previously found not to be feasible would in fact be feasible. The proposed changes that would be implemented as part of the Revised Project would not alter the findings in the Final IS/MND. In addition, no change has occurred with respect to the circumstances surrounding the proposed project that would cause new or substantially more severe significant environmental effects than identified in the Final IS/MND, and no new information has become available that shows that the project would cause significant environmental effects not already analyzed in the Final IS/MND. Therefore, no further environmental review is required beyond this Addendum to the Final IS/MND.

Attachment: Figures
 Traffic Analysis Memo



NOTES:

1. Recent widening of Bollinger Canyon Road incorporated in plan.
2. Scaled dimensions shown in brackets (...)

LEGEND:

G: Gas

PH: Phone

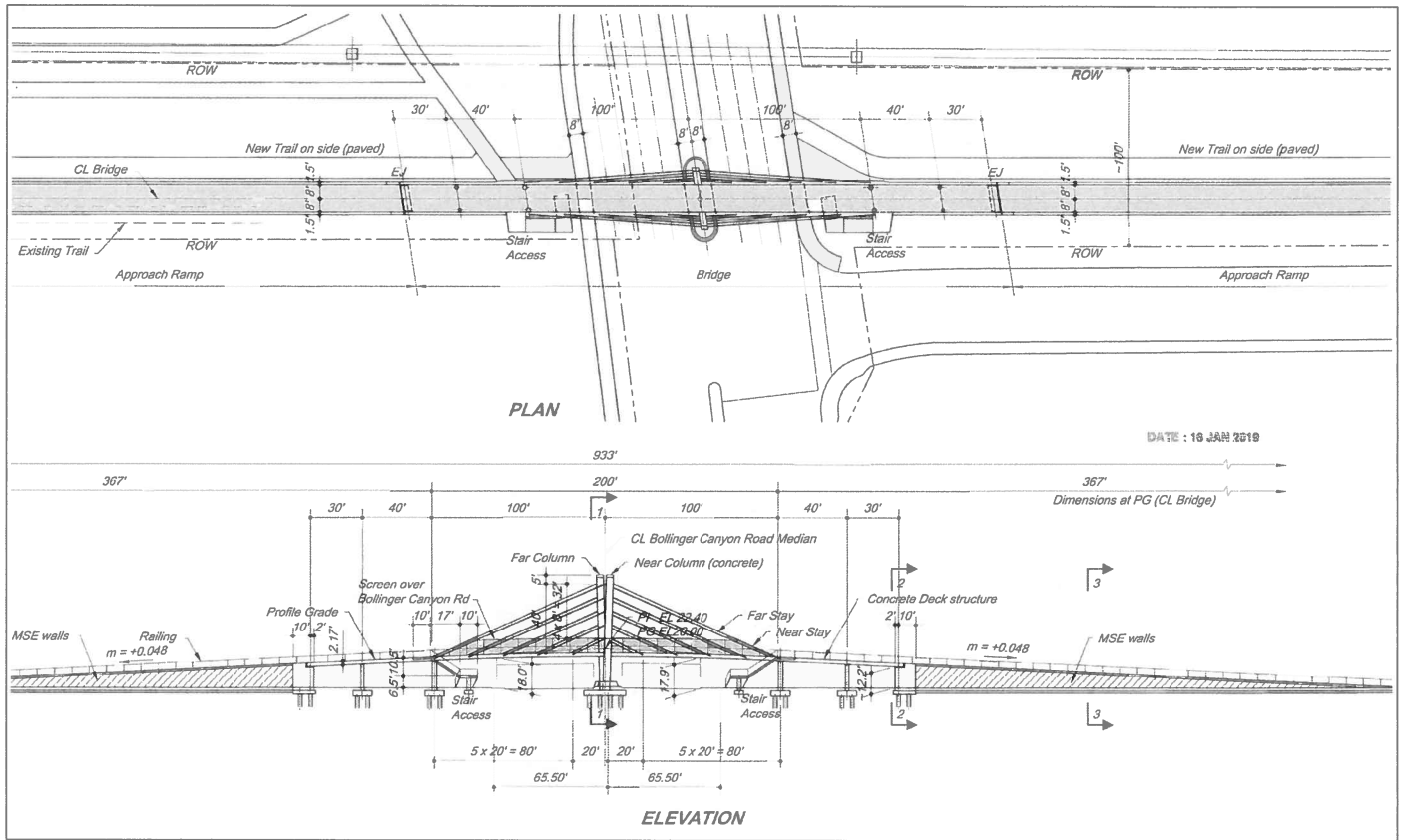
LSA

FIGURE 1

NOT TO SCALE

San Ramon Iron Horse Trail Overcrossings Project
Site Plan

SOURCE: CITY OF SAN RAMON, FEBRUARY 2019.
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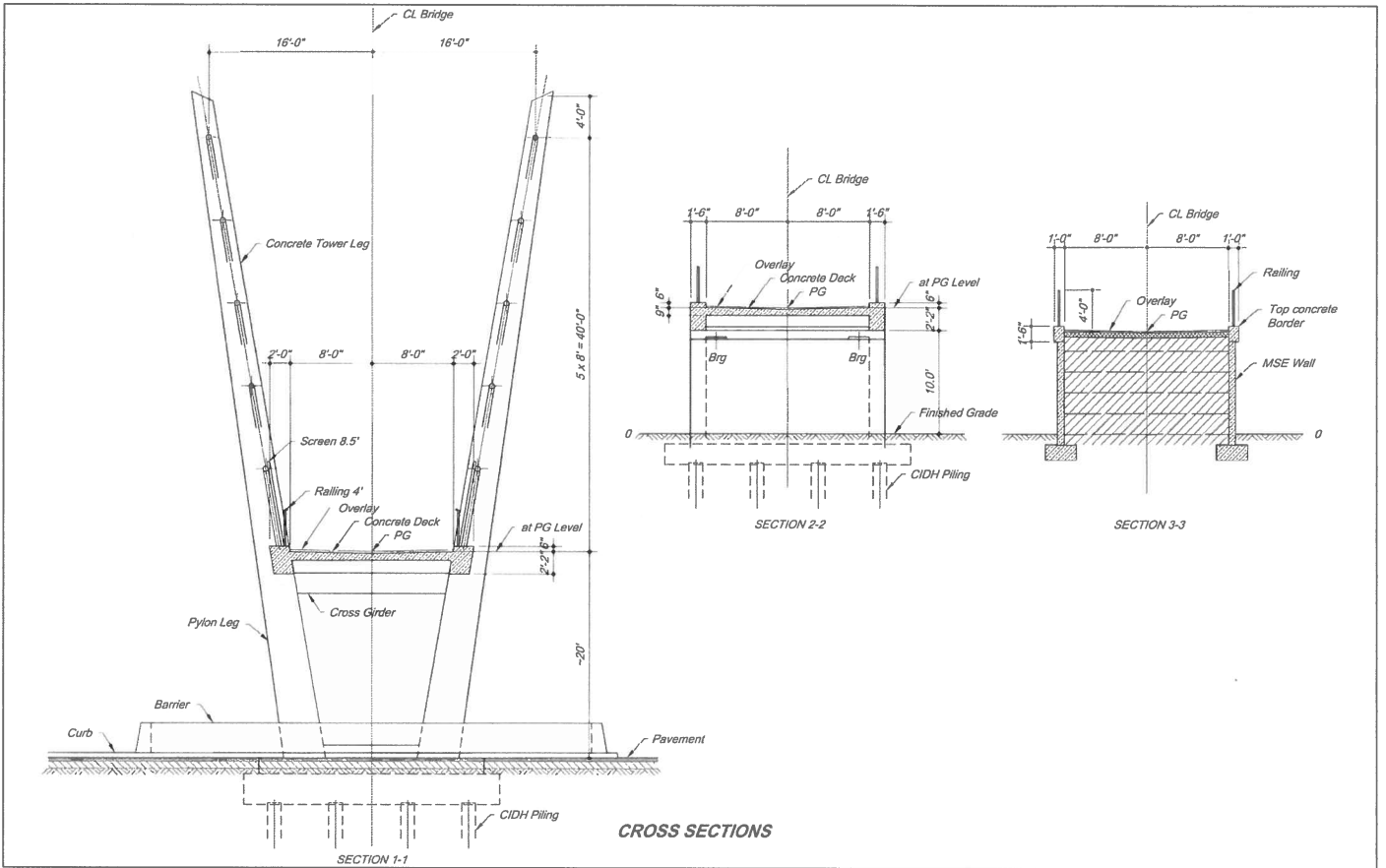
LSA

FIGURE 2

NOT TO SCALE

SOURCE: CITY OF SAN RAMON, FEBRUARY 2019.
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San Ramon Iron Horse Trail Overcrossings Project
 General Plan/Elevation



LSA

FIGURE 3

NOT TO SCALE



SOURCE: CITY OF SAN RAMON, FEBRUARY 2019.

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San Ramon Iron Horse Trail Overcrossings Project
Cross Sections



PUBLIC WORKS
ENGINEERING SERVICES DIVISION
INTEROFFICE MEMORANDUM

DATE: May 3, 2019
TO: Theresa Peterson, Associate Engineer
FROM: Deborah Fehr, Senior Engineer
SUBJECT: CIP 5530 Bollinger Pedestrian Overcrossing – New Bridge Concept
Elimination of Left Turn Lane Analysis

The Bollinger Pedestrian Overcrossing Project is proposing an alternate bridge design that includes a structural pylon in the existing westbound left turn lane at the intersection of Bollinger Canyon Road / Bishop Ranch 1 East. The location of the pylon would eliminate the left turn lane. This technical memo analyzes whether removing the left turn lane would create a significant impact.

The most recent analysis performed along Bollinger Canyon Road in the vicinity of the Iron Horse Trail (IHT) crossing was in 2018 for the San Ramon Retail General Plan Amendment. The analysis scenarios included Existing Conditions, Existing plus Project Conditions, Cumulative Conditions, and Cumulative plus Project Conditions. The Cumulative plus Project Conditions are representative of buildout of the General Plan and the “Project” includes the additional project trips that can be attributed to the proposed Retail project analyzed for the General Plan Amendment. The Cumulative plus Project Conditions scenario was used as the base for this analysis.

As a conservative estimate, the project volumes from the 2007 City Center Environmental Impact Report (EIR) for the westbound left turn lanes at Bollinger / Bishop Ranch 1 East and Bollinger / Camino Ramon were added to the San Ramon Retail General Plan Amendment Cumulative plus Project volumes. Since the proposed new bridge concept would eliminate the westbound left turn lane at the intersection of Bollinger / Bishop Ranch 1 East, it was assumed the westbound left turn volumes from Bollinger / Bishop Ranch 1 East would use the westbound left turn at Bollinger / Camino Ramon since they both serve the same parcel. Therefore, the Bollinger / Bishop Ranch 1 East westbound left turn volumes were added to the left turn volumes at Bollinger / Camino Ramon.

The Synchro® analysis software was used to calculate the intersection level of service (LOS) based on the 2000 Highway Capacity Manual (HCM). The resulting LOS and delay for the intersection of Bollinger / Camino Ramon are shown below. The City requires a LOS of D or better. The intersection is expected to operate at acceptable levels of service with the redistribution of the westbound left turn lane volumes from Bollinger / Bishop Ranch 1 East to the westbound left turn at the intersection of Bollinger / Camino Ramon. The impact is less than significant.

| Analysis Period | LOS | Control Delay |
|-----------------|-----|---------------|
| AM Peak | D | 47.8 |
| PM Peak | D | 52.4 |

























HCM Signalized Intersection Capacity Analysis
 8: Bishop Ranch 1/Camino Ramon & Bollinger

Timing Plan: AM Peak
 05/01/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|-------|------|-------|------|-------|---------------------------|------|------|------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 698 | 1031 | 507 | 374 | 2508 | 551 | 33 | 67 | 14 | 196 | 99 | 232 |
| Future Volume (vph) | 698 | 1031 | 507 | 374 | 2508 | 551 | 33 | 67 | 14 | 196 | 99 | 232 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 |
| Total Lost time (s) | 4.0 | 3.5 | 3.5 | 4.0 | 3.5 | 4.5 | 4.0 | 3.0 | 3.0 | 4.0 | 3.0 | 4.0 |
| Lane Util. Factor | 0.97 | 0.86 | 1.00 | 0.97 | 0.86 | 1.00 | 1.00 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.94 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3319 | 6194 | 1531 | 3319 | 6194 | 1531 | 1711 | 1801 | 1531 | 3319 | 1600 | 1454 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3319 | 6194 | 1531 | 3319 | 6194 | 1531 | 1711 | 1801 | 1531 | 3319 | 1600 | 1454 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 751 | 1109 | 545 | 402 | 2697 | 592 | 35 | 72 | 15 | 211 | 106 | 249 |
| RTOR Reduction (vph) | 0 | 0 | 223 | 0 | 0 | 246 | 0 | 0 | 14 | 0 | 20 | 60 |
| Lane Group Flow (vph) | 751 | 1109 | 322 | 402 | 2697 | 346 | 35 | 72 | 1 | 211 | 166 | 109 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | 5 |
| Permitted Phases | | | 2 | | | 6 | | | 4 | | | 8 |
| Actuated Green, G (s) | 28.0 | 76.3 | 76.3 | 22.5 | 70.8 | 70.8 | 7.1 | 11.4 | 11.4 | 19.3 | 23.6 | 51.6 |
| Effective Green, g (s) | 29.0 | 78.3 | 78.3 | 23.5 | 72.8 | 71.8 | 8.1 | 13.4 | 13.4 | 20.3 | 25.6 | 53.6 |
| Actuated g/C Ratio | 0.19 | 0.52 | 0.52 | 0.16 | 0.49 | 0.48 | 0.05 | 0.09 | 0.09 | 0.14 | 0.17 | 0.36 |
| Clearance Time (s) | 5.0 | 5.5 | 5.5 | 5.0 | 5.5 | 5.5 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 641 | 3233 | 799 | 519 | 3006 | 732 | 92 | 160 | 136 | 449 | 273 | 558 |
| v/s Ratio Prot | c0.23 | 0.18 | | 0.12 | c0.44 | | 0.02 | 0.04 | | c0.06 | c0.10 | 0.04 |
| v/s Ratio Perm | | | 0.21 | | | 0.23 | | | 0.00 | | | 0.04 |
| v/c Ratio | 1.17 | 0.34 | 0.40 | 0.77 | 0.90 | 0.47 | 0.38 | 0.45 | 0.01 | 0.47 | 0.61 | 0.20 |
| Uniform Delay, d1 | 60.5 | 20.9 | 21.7 | 60.7 | 35.2 | 26.4 | 68.5 | 64.8 | 62.3 | 59.9 | 57.6 | 33.3 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 0.91 | 0.86 | 1.19 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 93.1 | 0.3 | 1.5 | 5.3 | 3.6 | 1.6 | 2.6 | 2.0 | 0.0 | 0.8 | 3.8 | 0.2 |
| Delay (s) | 153.6 | 21.2 | 23.2 | 60.6 | 33.8 | 32.9 | 71.1 | 66.8 | 62.3 | 60.7 | 61.4 | 33.5 |
| Level of Service | F | C | C | E | C | C | E | E | E | E | E | C |
| Approach Delay (s) | | 63.0 | | | 36.6 | | | 67.5 | | | 52.8 | |
| Approach LOS | | E | | | D | | | E | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 47.8 | | | HCM 2000 Level of Service | | | D | | | |
| HCM 2000 Volume to Capacity ratio | | | 0.88 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 150.0 | | | Sum of lost time (s) | | | 14.5 | | | |
| Intersection Capacity Utilization | | | 83.7% | | | ICU Level of Service | | | E | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
8: Bishop Ranch 1/Camino Ramon & Bollinger

Timing Plan: PM Peak
05/01/2019

| |  |  |  |  |  |  |  |  |  |  |  |  | |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  | |
| Traffic Volume (vph) | 342 | 1706 | 55 | 81 | 1068 | 197 | 424 | 113 | 7 | 476 | 40 | 759 | |
| Future Volume (vph) | 342 | 1706 | 55 | 81 | 1068 | 197 | 424 | 113 | 7 | 476 | 40 | 759 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Width | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | |
| Total Lost time (s) | 4.0 | 3.5 | 3.5 | 4.0 | 3.5 | 4.5 | 4.0 | 3.0 | 3.0 | 4.0 | 3.0 | 4.0 | |
| Lane Util. Factor | 0.97 | 0.86 | 1.00 | 0.97 | 0.86 | 1.00 | 1.00 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | |
| Frts | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.86 | 0.85 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | 3319 | 6194 | 1531 | 3319 | 6194 | 1531 | 1711 | 1801 | 1531 | 3319 | 1479 | 1454 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (perm) | 3319 | 6194 | 1531 | 3319 | 6194 | 1531 | 1711 | 1801 | 1531 | 3319 | 1479 | 1454 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | |
| Adj. Flow (vph) | 368 | 1834 | 59 | 87 | 1148 | 212 | 456 | 122 | 8 | 512 | 43 | 816 | |
| RTOR Reduction (vph) | 0 | 0 | 37 | 0 | 0 | 147 | 0 | 0 | 7 | 0 | 238 | 90 | |
| Lane Group Flow (vph) | 368 | 1834 | 22 | 87 | 1148 | 65 | 456 | 122 | 1 | 512 | 197 | 334 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | 5 | |
| Permitted Phases | | | 2 | | | 6 | | | 4 | | | 8 | |
| Actuated Green, G (s) | 19.0 | 54.9 | 54.9 | 8.8 | 44.7 | 44.7 | 43.1 | 15.6 | 15.6 | 50.2 | 22.7 | 41.7 | |
| Effective Green, g (s) | 20.0 | 56.9 | 56.9 | 9.8 | 46.7 | 45.7 | 44.1 | 17.6 | 17.6 | 51.2 | 24.7 | 43.7 | |
| Actuated g/C Ratio | 0.13 | 0.38 | 0.38 | 0.07 | 0.31 | 0.30 | 0.29 | 0.12 | 0.12 | 0.34 | 0.16 | 0.29 | |
| Clearance Time (s) | 5.0 | 5.5 | 5.5 | 5.0 | 5.5 | 5.5 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 442 | 2349 | 580 | 216 | 1928 | 466 | 503 | 211 | 179 | 1132 | 243 | 462 | |
| v/s Ratio Prot | 0.11 | c0.30 | | 0.03 | c0.19 | | c0.27 | 0.07 | | 0.15 | c0.13 | c0.10 | |
| v/s Ratio Perm | | | 0.01 | | | 0.04 | | | 0.00 | | | 0.13 | |
| v/c Ratio | 0.83 | 0.78 | 0.04 | 0.40 | 0.60 | 0.14 | 0.91 | 0.58 | 0.01 | 0.45 | 0.81 | 0.72 | |
| Uniform Delay, d1 | 63.4 | 41.0 | 29.3 | 67.3 | 43.7 | 37.9 | 51.0 | 62.7 | 58.5 | 38.5 | 60.4 | 47.7 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 0.67 | 0.97 | 1.85 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 12.6 | 2.7 | 0.1 | 1.2 | 1.3 | 0.6 | 19.8 | 3.8 | 0.0 | 0.3 | 18.2 | 5.5 | |
| Delay (s) | 76.0 | 43.7 | 29.4 | 46.1 | 43.8 | 70.7 | 70.8 | 66.5 | 58.5 | 38.8 | 78.6 | 53.2 | |
| Level of Service | E | D | C | D | D | E | E | E | E | D | E | D | |
| Approach Delay (s) | | 48.6 | | | 47.9 | | | 69.7 | | | 55.9 | | |
| Approach LOS | | D | | | D | | | E | | | E | | |
| Intersection Summary | | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 52.4 | | | | | | | | | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | | | 0.82 | | | | | | | | | | |
| Actuated Cycle Length (s) | | | 150.0 | | | | | | | | | Sum of lost time (s) | 14.5 |
| Intersection Capacity Utilization | | | 83.4% | | | | | | | | | ICU Level of Service | E |
| Analysis Period (min) | | | 15 | | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | | |