

CASE STUDIES

Pedestrian overcrossings are being implemented throughout the region and their benefits are becoming more broadly known. Case Studies provide an important means of evaluating the project in the context of similar projects. Included are some different pedestrian overcrossings that were constructed or designed that provide a sense of the different ways projects were started and implemented.

	Moffert Boulevard Overcrossing	Iron Horse Trail Overcrossing at Ygnacio Valley Road	Mary Avenue Bicycle Bridge	Iron Horse Trail Overcrossing at Treat Boulevard	South Bayfront Pedestrian and Bicycle Bridge	John Hernandez Bridge	Stevens Creek Trail Caltrain POC
cost	\$4.9M	\$2-3M	\$14.8M	\$8.2M	\$8M	\$870,000	\$3M
year built	2009	1998	2009	2009	est. Spring 2010	1993	2001
length of span	146 M	900 ft.	500 ft.	860 ft.	1,300 ft.	400 ft.	1100 ft.
location	Mtn. View	Walnut Crk	Cupertino	Pleasant Hill	Emeryville	Half Moon Bay	Mtn. View
structure type	prefabricated steel through truss	steel arch	single-span cable-stayed steel bridge	arch	single arch cable-stayed	prefabricated steel through truss	box truss



MARY AVENUE BICYCLE FOOT BRIDGE

Cupertino, CA

This pedestrian overcrossing crosses I-280 between Homestead Road and Meteor Drive on Mary Avenue in Cupertino and provides a safe and user-friendly route over I-280 for residents and students to and from the cities of Cupertino and Sunnyvale.

The funding for this project came from the VTA (Valley Transportation Authority) and the Santa Clara County Bicycle Expenditure Program, as well as the Bicycle Transportation Account, the City of Cupertino and the City of Sunnyvale. Some support and funding also came from Caltrans. This project was instigated and managed by the City of Cupertino.

The ground breaking ceremony for this overcrossing was on January 24, 2008. The official start date of construction was February 1, 2008, with construction completed in the second quarter of 2009.



MARY AVENUE BICYCLE FOOT BRIDGE -
CONCEPTUAL RENDERING

FIGURE 63



IRON HORSE TRAIL OVERCROSSING AT YGNACIO VALLEY ROAD

Walnut Creek, CA

On May 16, 1998, Walnut Creek and East Bay Regional Park District officials dedicated the Iron Horse Trail Overcrossing at Ygnacio Valley Road. The \$2 - 3 million pedestrian and cyclist bridge was financed with federal, state, City, and park district funds. An estimated 1 million persons are expected to use the overcrossing annually.

The driving force for this pedestrian overcrossing was the City of Walnut Creek. They received a federal grant and the project was funded with that money as well as Measure C funds. The intersection near the crossing was very busy with many pedestrians and bicyclists continually crossing the busy road to access the Iron Horse Trail. The City wanted to eliminate the crosswalk to improve vehicle traffic flow and increase pedestrian accessibility. There was no feasibility study completed for this project, so information from the East Bay Regional Park District was used to gather usage data.

The overcrossing was bid in 1997 and built a few years later. Today the City of Walnut Creek maintains this overcrossing and it remains an important link for the Iron Horse Trail users, allowing them more accessibility and greater connection to their city.



OVERCROSSING AT YGNACIO VALLEY ROAD

FIGURE 64





TREAT BOULEVARD
OVERCROSSING -
CONCEPTUAL RENDERING

FIGURE 65

TREAT BOULEVARD OVERCROSSING

Pleasant Hill, CA

Pedestrians and bicyclists will soon be able to use the proposed Treat Boulevard overcrossing. The bridge will be within the Iron Horse Trail Corridor and will increase pedestrian and bicyclist safety for those going to and from the Pleasant Hill BART station. Through community input and surveys the design for the bridge was chosen. This bridge will be important for increasing accessibility and safety along the Iron Horse Trail.

An overcrossing at Treat Boulevard has been a feature of the Contra Costa County General Plan since 1983. The plan originally proposed an overcrossing a block west at Treat and Oak Boulevards since it was thought that the primary pedestrian flow would be from BART at Oak and Treat Boulevards. It was assumed that the overcrossing was going to take off from an elevated portion of the BART Station. There was no specific traffic or feasibility study done specifically for this overcrossing, but in the Contra Costa County specific plan there were general traffic studies conducted at the intersection.

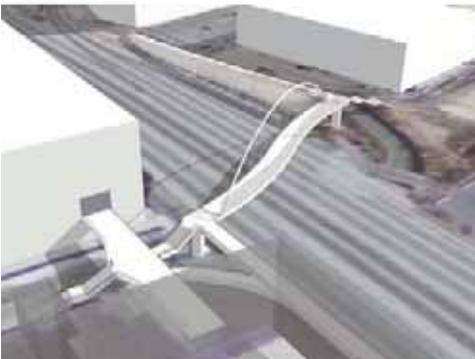
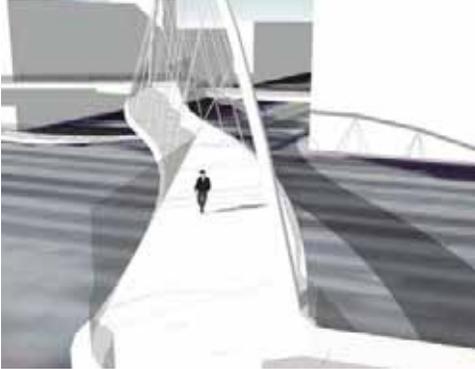
Constituency emerged for the overcrossing to be connected to the Iron Horse Trail due to input from pedestrians and bicyclists of the trail. This desire from the pedestrians and bicyclists was the main driving force for the development of the Treat Overcrossing. Some of the neighboring residents were concerned about the implementation of an overcrossing, however, gathering their input and listening to their design ideas and concerns proved to be helpful in gaining support and momentum for the project. An online survey was used where 900 people voted on the design of the bridge.

After a plan was adopted, various designs were presented to the public through community workshops. There, they were able to provide input on the bridge's design and project considerations.

The funding for this project came from multiple sources, including Measure C funds, Transportation for Livable Communities (TLC) funds, and Housing Incentive Funds (HIF).

This overcrossing is anticipated to be completed in the spring 2009.





SOUTH BAYFRONT PEDESTRIAN AND BICYCLE BRIDGE

Emeryville, CA

This pedestrian overcrossing will connect to the Emeryville Greenway Trail, and ultimately the Bay Trail. This project was part of the City's General plan and did not have a feasibility study developed. The South Bayfront Bridge originally was started 4-5 years ago, and is currently in its final design and approval stages.

This project was led and completely funded by the City of Emeryville. The City's own funding has led to the quick design and implementation of this project.

A preliminary design was completed in the summer of 2008, and during meetings in the fall, comments concerning details were gathered from: the community, the South Bayfront Pedestrian-Bicycle Bridge Committee, the Bicycle-Pedestrian Sub-committee, the Planning Commission and the Redevelopment Agency. The project's design is anticipated to be complete and out for public bids by spring 2010, with construction completion in 2011.

SOUTH BAYFRONT PEDESTRIAN AND BICYCLE BRIDGE - CONCEPTUAL RENDERING FIGURE 66



JOHN HERNANDEZ BRIDGE

Half Moon Bay, CA

This pedestrian overcrossing in Half Moon Bay crosses Pilarcitos Creek and is an essential for facilitating pedestrian, bicycle and equestrian accessibility over the Pilarcitos creek. This overcrossing was developed as a part of the California Coastal Trail Program. This overcrossing was initiated by the City of Half Moon Bay, with this overcrossing project as Phase 2 of their Master Plan. The Coastal Conservancy approved and funded this overcrossing.

Many different agencies were involved in this project, such as the State Park and Recreation Department, The Department of Fish and Game (CFG), as well as various coastal departments and agencies. This project had to be carefully coordinated and have smooth interagency coordination for its success. Engineering challenges were faced when dealing with sandy soils and an area rich in wildlife. Working carefully to manage sewage and utility lines was necessary.

Today the John Hernandez Bridge serves an important role in its community, by increasing pedestrian accessibility, as well as preserving the wetland and creek nature and wildlife.



JOHN HERNANDEZ BRIDGE

FIGURE 67





BERKELEY I-80
PEDESTRIAN OVERCROSSING

FIGURE 68

BERKELEY I-80 PEDESTRIAN OVERCROSSING

Berkeley, CA

The Berkeley I-80 Pedestrian Overcrossing is an important addition to the Bay Area, allowing for accessibility and transportation between Berkeley and its Marina/waterfront park region. The overcrossing is 300 feet long, with a 5-foot raised pedestrian lane and two 8-foot bicycle/wheelchair lanes. The bridge is fully ADA compliant, and the ramps feature a 5% grade making it the longest unsupported pedestrian bridge in California. This bridge was opened on February 27, 2002. It costs approximately \$6.4 million to build, exclusive of design and permitting costs.

The Berkeley I-80 Pedestrian Overcrossing provides ADA-compliant access between the City of Berkeley and the Eastshore Regional Park (Berkeley Marina) to pedestrians, bicyclists, and wheelchairs. Its 90 meter clear span across one of the most congested freeways in North America provides an architectural landmark for the City and allows for the planned future reconfiguration of the freeway without modifications to the bridge.

The arch bridge across the freeway has a span of 90 meters, with a post-tensioned lightweight concrete edge girder deck, and steel arch ribs consisting of curved inclined steel tubes in a basket handle configuration. The approach spans are curved post-tensioned concrete box girders to provide wide radius turns for aesthetic and bicycle safety. The bridge was designed to meet strict seismic criteria for a near-field M7.1 earthquake on the Hayward fault, about 3 km from the site.

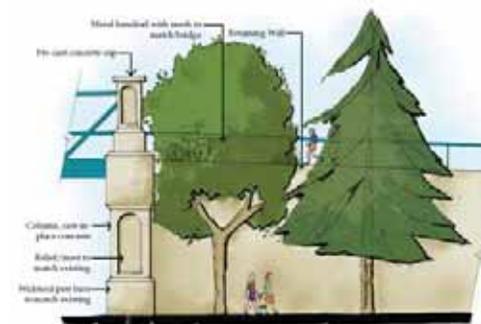
Today, this pedestrian overcrossing is an important addition because it provides links to the neighboring communities and creates a visual statement in its environment.



STEVENS CREEK TRAIL/MOFFETT BOULEVARD OVERCROSSING

Mountain View, CA

This pedestrian overcrossing project is a pedestrian and bicycle overcrossing over Moffett Boulevard and the north-bound off-ramp for State Highway 85 to provide a grade separation for the existing Stevens Creek Trail. The overcrossing is a prefabricated steel truss structure, 3.05 meters wide and 146 meters long.



MOFFETT BOULEVARD
OVERCROSSING -
CONCEPTUAL RENDERING

FIGURE 69

An at-grade crossing currently exists along the Stevens Creek Trail at Moffett Boulevard. This proposed pedestrian overcrossing provides an alternative to the at-grade crossing, reducing potential conflicts between cyclists and motor vehicles. The existing at-grade crossing will remain to provide pedestrians and cyclists on Moffett Boulevard convenient access to Stevens Creek Trail.

This overcrossing is an important addition to the Stevens Creek Trail, and will enhance connectivity between different entities. This project went out to bid in April, 2008, and was constructed in 2009.



TRAIL CROSSING CONCEPTS

COMMON REQUIREMENTS

Design Parameters for the overcrossings at Sycamore Valley, Crow Canyon and Bollinger Canyon Roads were taken from different sources. One of the most broadly adopted sources of design criteria is provided by the State of California Department of Transportation (Caltrans). Adherence to Caltrans criteria is a requirement for projects within Caltrans right of way and where adopted by the local municipality. The Caltrans criteria provide a set of time tested requirements. As Caltrans is responsible for the implementation of safe, maintainable structures the criteria applied to structures includes conservative assumptions. This feasibility study assumes partial, but not wholesale adoption of Caltrans standards. For the following bridge concepts, these design parameters were used:

Vertical Clearance

The minimum vertical clearance to the underside of a bridge is 17' per Caltrans' requirements for pedestrian overcrossings over the traveled way of state roadways. For purposes of the concepts presented in this report a 17'-0" clearance at each intersection is assumed.

Tread Width

A tread width of 10 feet is proposed for the Crow Canyon and Sycamore Valley Road POC's. A tread width of 12 feet is proposed for the Bollinger Canyon Road POC. Tread widths are based on minimums recommended for the anticipated traffic volumes. Wider treads are not proposed due to cost impacts and the difficulty associated with accommodating a wider bridge within the corridors where significant existing and proposed uses must also be accommodated.

Guardrails

All crossings are proposed to include guardrails in compliance with Title 24; a minimum of 54" tall with no openings large enough to allow a 6" sphere to pass through.

Approaches

Approaches will have a continuous slope of 5% and are therefore not ramps (as defined by Title 24). Although providing these minimum slopes results in longer approach ramps, the elimination of intermittent level pads and continuous handrails that would be required of steeper approaches will make the bridges much easier to negotiate for bicyclists.



TRAIL CROSSING CONCEPTS

Screening

Caltrans requires a screen fencing with a minimum height of 8'-4" along the sides of a pedestrian overcrossing. Screening in conformance with Caltrans requirements is not proposed and will require further evaluation. Advantages of the screening are an additional measure of safety as persons on the bridge will be less able to climb over the fencing than a guardrail alone. Screening also tends to discourage throwing or tossing of objects from the bridge onto the roadbed below. Conversely, screening tends to significantly change the character of the bridge and the experience of persons travelling across the bridge. Views are obscured and a sense of openness is lost. Additionally, screening will increase the visual impact of the bridge from the roads below, tending to increase the perception of mass.

Embankments

Approach ramps can be built according to three basic designs including:

- Earthen mounds with sloping sides
- Earthen mounds with vertical, mechanically stabilized earth (MSE) sides
- Spans (approach bridges)

Earthen mounds with sloping sides are not considered practical because of the narrowness of the corridor and the presence of existing and future uses.

Earthen mounds with MSE sides are proposed to allow the construction of approaches on grade (compacted earth) up to an elevation of approximately 7 feet. With a conservative design parameter of the width of the supported area equal to not more than ½ the height, 7 feet approximates a 14 foot 'footprint' which is assumed to be achievable within the constraints of the corridors. Intermediate, smaller spans are proposed to connect the roadway spans with the approach ramps.

Lighting

Bridge surfaces will be illuminated to IES standards to permit safe passage during all hours that the trail is in use. Additionally, it is anticipated that the bridges will be up-lit for aesthetic purposes to enhance their appearance at night and discourage inappropriate activity.



TRAIL CROSSING CONCEPTS

Maintenance

The bridges will be wide enough to accommodate a light maintenance vehicle and are not proposed to accommodate larger vehicles. Where vehicular access to both ends of a bridge can be reasonably achieved without using the bridge, it is generally better to have a design to accommodate the needs of pedestrians and bicyclists only. Designing to accommodate larger vehicles tends to increase costs and can necessitate changes to the trail and bridge geometry (widths, turning radii, etc.) The bridges will be designed to minimize the maintenance.

Bridge Design Alternatives

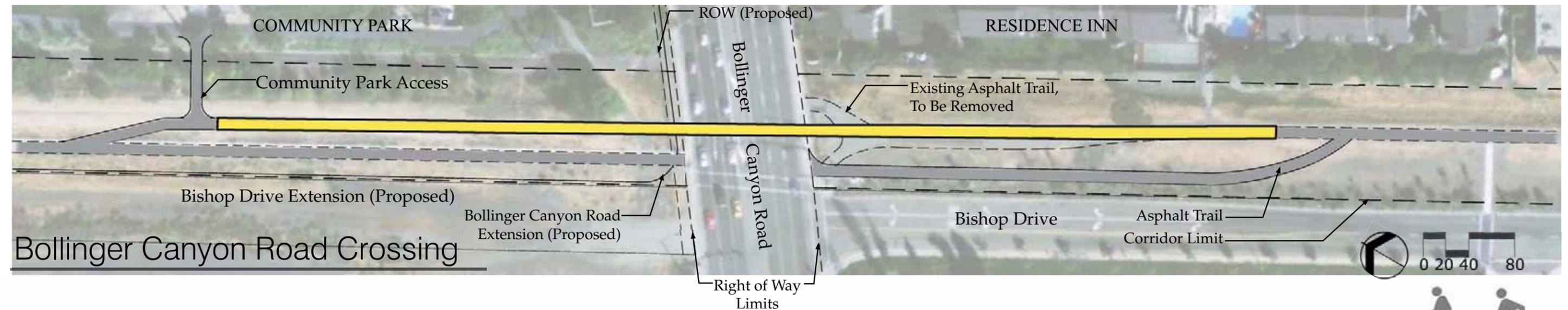
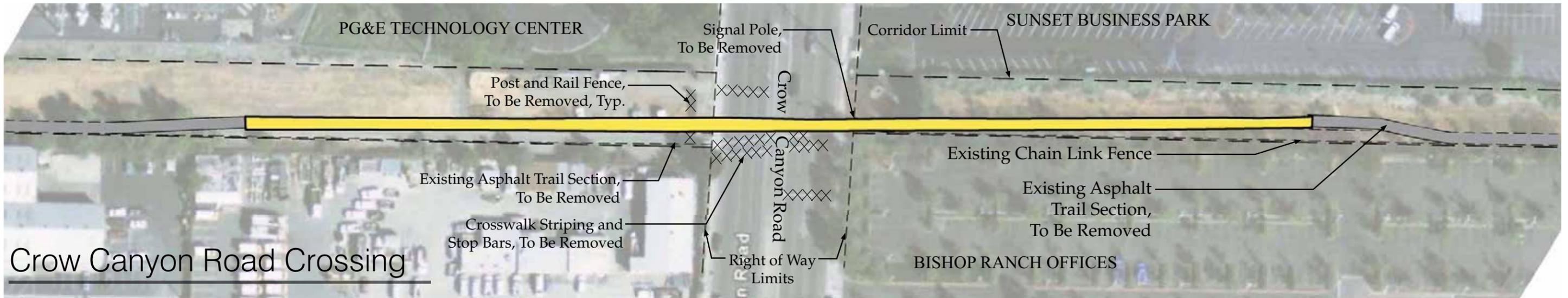
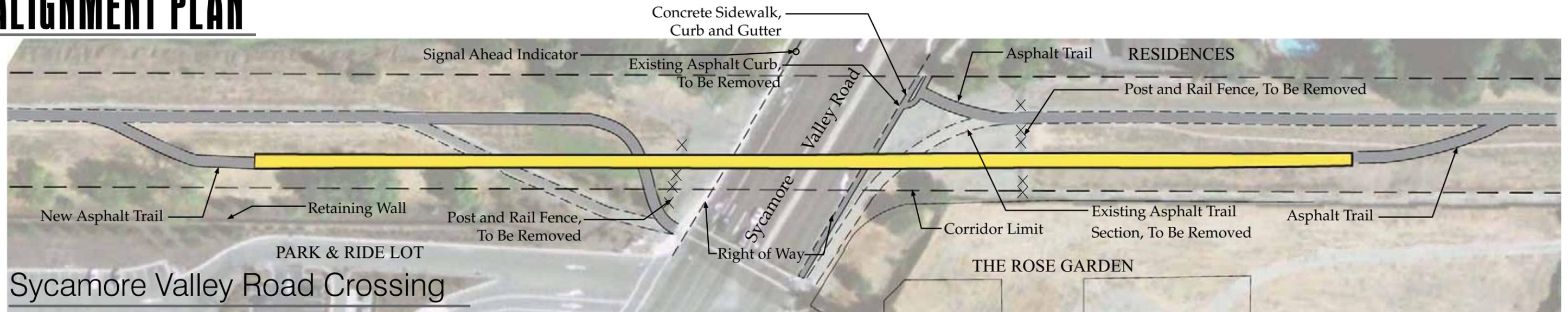
Overcrossings at all three locations should be responsive to their existing site context. At Bollinger Canyon Road, the site is anticipated to change dramatically due to the City Center development. Consideration of this change should be accounted for when developing an overcrossing concept.

Bridge Alignments

Refer to the drawing 'Alignment Plan', for overall illustrations of the bridge layouts in relation to the trail.



ALIGNMENT PLAN



IRON HORSE TRAIL

Pedestrian and Bicycle Corridor Concept Plan



TRAIL CROSSING CONCEPTS

**BIGGS CARDOSA
ASSOCIATES INC**
STRUCTURAL ENGINEERS

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March 7, 2008
Revised March 24, 2008
Revised May 22, 2008
2007171

Callander Associates Landscape Architecture, Inc.
311 Seventh Avenue
San Mateo, CA 94401-4259

Attention: Colleen Salveson

Subject: Iron Horse Trail Pedestrian Overcrossings

Dear Colleen,

Biggs Cardosa Associates, Inc. has reviewed the bridge alternatives dated February 27, 2008 for the Iron Horse Trail crossings of Sycamore Valley Road, Crow Canyon Road and Bollinger Canyon Road and attended a meeting with the City to discuss the alternatives. The alternatives are summarized as:

Bowstring Truss POC

- Main Span: 12' wide x 150' span, prefabricated steel bowstring through truss with concrete deck
- Approach Bridges: Two 12' wide x 100' span, prefabricated steel bowstring through truss with concrete deck in addition to multiple shorter steel beam spans with concrete deck or short span pre-cast or cast-in-place concrete slab bridges
- Approach fill: Approach fill with slopes or concrete walls with fill supporting a concrete ramp

Box Truss POC

- Main Span: 12' wide x 130' span, constant depth prefabricated steel through truss with concrete deck
- Approach Bridges: Multiple shorter steel beam spans with concrete deck or short span pre-cast or cast-in-place concrete slab bridges
- Approach fill: Approach fill with slopes or concrete walls with fill supporting a concrete ramp

Arch POC

- Main Span: 12' wide x 140' span, steel arch bridge with suspended pre-cast or cast-in-place concrete deck
- Approaches: Four 12' wide x 140' spans, steel arch bridges with suspended pre-cast or cast-in-place concrete deck



TRAIL CROSSING CONCEPTS

May 22, 2008
Page 2

- Approach fill: Approach fill with slopes or concrete walls with fill supporting a concrete ramp

The main spans in a Bowstring POC and a Box Truss POC are pre-fabricated steel through trusses. A through truss consists of two parallel trusses connected at the floor level and overhead with crossbeams. Overhead crossbeams are typically used as a cost effective means to provide lateral stability to the top chord of long span trusses. Approach steel truss spans are shorter and therefore may not require overhead crossbeams.

The main truss span would be shipped to the site in two or three sections and unloaded in an open area near the abutments. After splicing of the sections, the full truss is lifted into place using one or two large cranes. A night closure of traffic lanes would be the most practical approach to truss erection. The number of cranes required depends on the truss unloading location and the available lanes for crane placement.

The main span and the approach spans for an Arch POC will be custom designed and fabricated steel arches with suspended deck made of pre-cast or cast-in-place concrete deck on steel beams. Arches can be shipped to the site in one or two pieces and lifted into place. Once the arches are in place the deck structure can be erected into place and suspended from the arches. Pre-cast concrete deck pieces will then be installed or concrete deck can be poured in place over metal decking. Falsework will not be required.

Abutments, piers and concrete walls (if required) are expected to be pile supported in accordance with the geotechnical recommendations. It may be possible to transition to spread footing foundations for the shorter walls at the lower ends of ramps if differential deflections between the foundation types can be reasonably controlled by isolation joints.

If concrete walls are used for the approach ramps, the area between opposing concrete walls would be backfilled near the beginning of the ramps and transition to a box type ramp foundation at the upper end of the ramps to avoid costly paired retaining walls besides the ramp.

The structural systems outlined in the three POC's are cost effective and constructible with minimal traffic impact.

Sincerely,

BIGGS CARDOSA
ASSOCIATES, INC.



Mahvash Harms; SE
Principal

M:\2007\171\Iron Horse Trail POC's Revised 5-22-08.doc



TRAIL CROSSING CONCEPTS



DOWNTOWN DANVILLE

FIGURE 70

Sycamore Valley Road Crossing

At this crossing the most appropriate bridge location is the eastern portion of the corridor, as show in Alternative A, on page 21. With this alignment there is no apparent conflict with the existing easements and the bridge is located further from homes.

The character of the bridge for the Sycamore Valley Road should fit in with the Town of Danville, which has brick and roofed elements throughout the Town. One option would be to design the bridge borrowing from local elements, such as reddish weathered steel. The clearance for this bridge is 17', with a span of 150', ramps at a 5% grade, and overall length of 950'.



SYCAMORE VALLEY ROAD - PROPOSED BRIDGE AREA

FIGURE 71



SYCAMORE VALLEY ROAD AND IRON HORSE CORRIDOR

FIGURE 72



TRAIL CROSSING CONCEPTS

Crow Canyon Road Crossing

At this location, the bridge is located along the western edge of the 50' corridor. The intent is that the bridge not interfere with the transit/light rail corridor and fuel easement. This location would necessitate very little trail realignment where the bridge meets grade. Because it would no longer be necessary, the existing signal pole for the on grade crossing would be removed. As a result the traffic flow on Crow Canyon Road will be substantially improved.

The bridge at Crow Canyon Road should be designed to fit in with the surrounding businesses, as well as the homes near by. A bridge with cement plaster abutments and a Bouquet Canyon stone fascia would be an appropriate option for this location. The clearance for this bridge would be 17', with a span of 130', ramps at a 5% grade and an overall length of about 930'.



IRON HORSE TRAIL AT CROW CANYON

FIGURE 73



CROW CANYON ROAD - PROPOSED BRIDGE LOCATION

FIGURE 74



TRAIL CROSSING CONCEPTS



IRON HORSE TRAIL
CITY CENTER
LOCATION ON LEFT

FIGURE 75

Bollinger Canyon Road

This bridge location is centered on the trail corridor at the Bollinger Crossing. The bridge would be aligned between the transit/light rail corridor on the east and a storm drain easement to the west. The trail on the north end of the bridge will require minor realignment to meet up with the bridge ramp.

This bridge is anticipated to be custom designed and fabricated, in keeping with the significance and magnitude of the City Center improvements. This bridge should compliment the architecture and appearance of the City Center as manifested in the conceptual plans for this facility. The clearance for this bridge would be 17', similar to the others, with a span of 155', ramps at a 5%, and an overall length of about 955'.



BOLLINGER CANYON ROAD - PROPOSED BRIDGE LOCATION

FIGURE 76



IRON HORSE TRAIL AT BOLLINGER CANYON ROAD - LOOKING SOUTH

FIGURE 77



POTENTIAL BRIDGE CONCEPTS

BOWSTRING TRUSS



BOX TRUSS



ARCH



IRON HORSE TRAIL



BRIDGE CHARACTER IMAGERY



DULLES, VIRGINIA



STEAMBOAT SPRINGS, COLORADO



MOUNTAIN VIEW, CALIFORNIA



TENNESSEE



SAN JOSE, CALIFORNIA



WALNUT CREEK, CALIFORNIA



BRIDGE CHARACTER IMAGERY



SALT LAKE CITY, UTAH



CUPERTINO, CALIFORNIA



SAN MATEO, CALIFORNIA



TENNESSEE



REDDING, CALIFORNIA



REDDING, CALIFORNIA



BRIDGE CHARACTER IMAGERY



SAN JOSE, CALIFORNIA



SAN JOSE, CALIFORNIA



SANTA ROSA, CALIFORNIA



SAN JOSE, CALIFORNIA



TEL AVIV, ISRAEL



RALEIGH, NORTH CAROLINA



COSTS

The attached estimate of probable construction costs is based on the conceptual plans and previous experiences in the construction of similar bridge structures. The reader is cautioned that these costs are approximate only and subject to revision based on further design refinement, variations in the economic climate and additions or reductions in the scope of improvements anticipated. The estimates are based on a set of assumptions including minimal conflicts with utilities and other unforeseen conditions. In the event that more conflicts are discovered during either design or construction, the cost of implementation of the crossings will increase proportionately. Because construction is not anticipated for 3 to 4 years it is anticipated that the actual projects costs may be higher due to inflation, changes in design, changes in regulatory requirements, and other factors.

APPROXIMATE PROJECT COSTS

Bowstring Truss Design

- Site Improvements.....\$293,000
- Bridge Construction.....\$4,694,000
- Design, Permitting, Administration..... \$2,047,000

Total Project Cost..... \$7,034,000

Box Truss Design

- Site Improvements..... \$270,000
- Bridge Construction..... \$3,822,000
- Design, Permitting, Administration..... \$1,679,000

Total Project Cost..... \$5,771,000

Arch Design

- Site Construction.....\$333,000
- Bridge Construction.....\$6,144,000
- Design, Permitting, Administration..... \$2,587,000

Total Project Cost..... \$9,064,000



PROJECT PERMITTING

Environmental Clearance

California State Law requires that all projects requiring a public hearing undergo an environmental review, in compliance with the California Environmental Quality Act. For purposes of this report policy requirements have been identified to the degree that the project is sufficiently defined for this purpose.

License Agreement

The City of San Ramon or the Town of Danville will need to obtain a license agreement with Contra Costa County for the development of any bridges in the Iron Horse Corridor.

Right of Entry Permit

A Right of Entry Permit is required by Contra Costa County.

Access Permit

The City or Town will need an Access Permit with East Bay Regional Parks District. In this agreement, it will be decided who will maintain what area and which authorities will take leadership.

Maintenance Agreement

The overcrossings will require maintenance. An agreement will need to be entered into by parties responsible for maintenance.

FUNDING

There are multiple types of funding that are obtainable listed in the chart below. This shows some of the grants/funding that could be available for a project of this type.

T-PLUS funding from MTC through the Contra Costa Transportation Authority is available for programs that encourage higher density development around transit stations.



IMPLEMENTATION

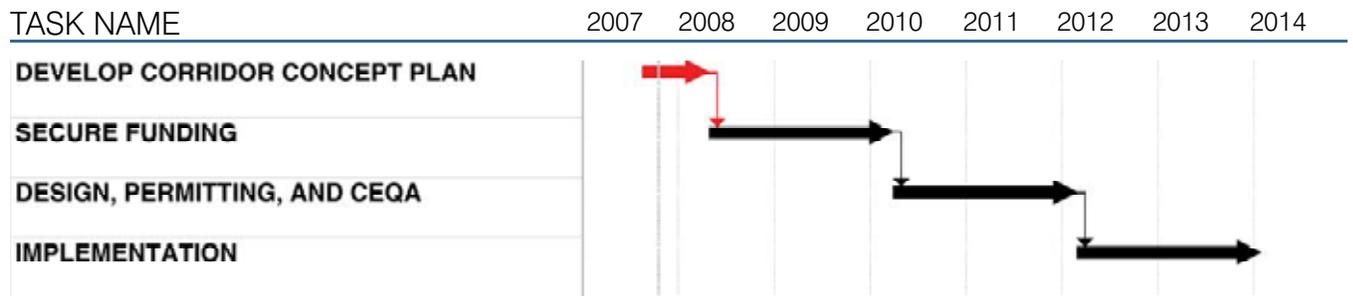
Grant Source	Typical Award (max)	Contact Info	Purpose
Recreational Trails Program (RTP)	\$300,000 (\$4,680,000 for CA for next 3 yrs)	California State Parks Office of Grants & Local Services PO Box 942896, Sacramento CA 94296 Steve Radosevich / 916-651-8579	Construction, maintenance, restoration, purchase and lease of lands. Funds go towards diverse recreational trail use, motorized recreation and non-motorized recreation.
Regional Bicycle & Pedestrian Program	\$300,000 min.	Steve Heminger (MTC) 101 8th St. Oakland, CA 94607 510-464-7700	Funding available for pedestrian and bicycle facilities that provide access to regional transit, activity centers, and schools.
Transportation for Livable Communities (TLC)	\$1,000,000	Metropolitan Transportation Commission Evelyn Baker / 510-817-5753 ebaker@mtc.ca.gov	For projects developed through an inclusive community planning effort, provide for a range of transportation choices, and support connectivity between transportation investments and land uses.
Bicycle Transportation Account (BTA)	\$300,000	California Department of Transportation Bicycle Facilities Unit 154, MS-1 Division of Local Assistance PO Box 942874, Sacramento, CA 94274 David Priebe / 916-653-0036	Improve safety and convenience for bicycle commuters. Requires approved Bicycle Transportation Plan.
TDA Article 3 Funds	\$600,000	Bob Bates (TDA Program Manager) 510-817-5733, bbates@mtc.ca.gov	Provides funding for pedestrian and bicycle projects in California.
Safe Routes to Schools (SRTS) (Federal Funding)	unknown	http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm	Funds projects that encourage and facilitate walking/bicycling to school, and improve children's safety.
Safe Routes to Schools (SR2S) (State Funding)	\$900,000 max.	Joyce Parks 916-653-6920 joyce_parks@dot.ca.gov	The SR2S program funds projects that improve the safety of pedestrian and bicycle routes to/from schools.
Caltrans Community Based Planning	\$300,000 max	Susan Youngs, Southern California Association of Governments/ 818 W. 7th St. Flr 12. Los Angeles, CA 90017/ (213) 236-1833	Caltrans provides funding coordinated with transportation and landuse planning that promotes public engagement, livable communities and a sustainable transportation system (mobility, access and safety)



NEXT STEPS

This report is the first step in the process of implementing pedestrian overcrossings at the various intersections. There are a number of steps that will be necessary for continuing this project and moving it forward. These steps include:

- Secure additional funding
- Prioritization of crossings - determining which crossing should be pursued first
- Development of refined plans
- Preparation of environmental documentation (CEQA)
- Preparation of preliminary and final design drawings
- Construction



FUTURE PROJECT PHASES

FIGURE 78

CONCEPT PLAN PRESENTATIONS

This concept plan was presented at the following meetings listed below:

- Danville Town Council 5/20/2008
- San Ramon City Council 6/10/2008
- San Ramon Transportation Advisory Committee 6/19/2008
- San Ramon Planning Commission 7/01/2008
- San Ramon Chamber of Commerce Board of Directors 9/09/2008
- San Ramon Park Commission 9/24/2008
- Contra Costa Iron Horse Trail Advisory Committee 11/17/2008



ACKNOWLEDGEMENTS

City of San Ramon

Lisa Bobadilla, Transportation Division Manager
Lauren Barr, Senior Planner

Town of Danville

Tai Williams, Transportation Services Director

East Bay Regional Park District

Jim Townsend, Trails Development Program Manager

Contra Costa County Public Works

John Pulliam, Associate Civil Engineer
Jenna Caldwell, Staff Engineer

Consultants

Callander Associates Landscape Architecture, Inc.

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Colleen Salveson, Project Assistant

Fehr and Peers

Emily Johnson, Transportation Planner
Ellen Poling, Associate in Charge

Biggs Cardosa Associates

Mahvash Harms, Principal in Charge

Contra Costa County Transportation Authority

Brad Beck, Senior Transportation Planner







Callander Associates
Landscape Architecture, Inc.

Via E-mail Only

August 31, 2007

Meeting Summary

Kick-off Meeting (PDT Meeting #1)

RE: IRON HORSE PEDESTRIAN AND BIKE CORRIDOR CONCEPT PLAN

Location of Meeting: San Ramon City Hall

Date of Meeting: August 27, 2007

Page 1 of 5

Attendees: *Project Development Team (PDT):*

Lisa Bobadilla (LB), Transportation Division Manager, City of San Ramon,
lbobadilla@sanramonca.gov

Lauren Barr (LBa), City of San Ramon, lbarr@sanramon.ca.gov

Tai Williams (TW), Town of Danville, twilliams@ci.danville.ca.us

Brad Beck (BB), Contra Costa Transportation Authority, bbeck@ccta.net

John Pulliam (JP), Contra Costa County Public Works, jpull@pw.cccounty.us

Jim Townsend (JT), East Bay Regional Park District, jtownsend@ebparks.org

Consultants:

Peter Callander, Callander Associates (CA), pcallander@callanderassociates.com

Mark Slichter, Callander Associates (CA), mslichter@callanderassociates.com

Robert Deegan, Callander Associates (CA), rdeegan@callanderassociates.com

Ellen Poling (FP), Fehr & Peers, e.poling@fehrrandpeers.com

The purpose of the meeting was to introduce the project, review the planning process, identify stakeholders and resources, and discuss various concerns, challenges, and opportunities that may arise during the planning process.

The following information was discussed and/or decided upon in our meeting:

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San Mateo, CA 94401-4259
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F 650.344.3290
www.callanderassociates.com

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Landscape Architecture
Urban Design
Land Planning
Park and Recreation Planning
Environmental Planning

Peter E. Callander, ASLA, Principal
A. Mark Slichter, ASLA, Principal
Brian G. Fletcher, ASLA, Principal
Erik Smith, ASLA, Principal
Benjamin W. Woodside, ASLA, Principal

Meeting Summary

Kick-Off Meeting

RE: IRON HORSE PEDESTRIAN AND BIKE CORRIDOR CONCEPT PLAN

Location of Meeting: San Ramon City Hall

Date of Meeting: August 27, 2007

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Item

Person and date to follow up

Project Background and Goals

- The project is federally funded by Transportation Planning Land Use (T-PLUS) grant money totaling \$100,000 and administered by the Contra Costa Transportation Authority (CCTA). The City of San Ramon and Town of Danville will front the cost of and be reimbursed through CCTA.
- Pedestrian/bicycle crossings at these locations (Bollinger Canyon, Crow Canyon) have long been discussed within the City of San Ramon and other agencies, but no plan has ever been previously developed.
- The goal is to present a completed Corridor Concept Plan to the Councils of both San Ramon and Danville by the prior to the end of August 2008.

CA to provide a project schedule to all meeting attendees (attached).

Project Administration

- The City of San Ramon will serve as the project lead for all involved public agencies. LB will act as the project manager and primary contact.
- CA will serve as the primary contact for the consulting team. However, FP will work directly with LB to acquire the necessary data for the upcoming traffic studies.
- Project documents should be formatted on project specific letterhead containing the project name and logos of the involved agencies.
- There should be a single contact number set up for all public inquiries regarding the project.
- Invoices must be formatted as required for federal funding. Ideally, a single invoice format may be developed that meets the needs of the CCTA, the City of San Ramon, and the Town of Danville.

FP to contact LB to request data by 9/7.

LB to provide CA with example by 8/31. CA to call LB to discuss.

LB to set up if feasible and provide number to CA.

BB to provide LB with an sample invoice format by 9/7. CA to develop a proposed invoice format to be circulated for comment.

Meeting Summary

Kick-Off Meeting

RE: IRON HORSE PEDESTRIAN AND BIKE CORRIDOR CONCEPT PLAN

Location of Meeting: San Ramon City Hall

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Stakeholders

- Following is a list of stakeholders identified at the Kick-off Meeting:
 - East Bay Bicycle Coalition (EBBC) - Umbrella group for several local bicycle groups. LB to provide CA with EBBC contact and contacts for the local groups by 9/7.
 - Various corporate bike groups (AT&T, Chevron, etc.) LB to provide CA with list by 9/7.
 - The neighborhoods just east of the Iron Horse Trail at the Sycamore Valley crossing in Danville are likely to be involved, particularly the neighbors along Everett Place. These communities are not represented by HOAs. TW to provide mailing list for these neighborhoods.
 - HOA groups in San Ramon, specifically Vista San Ramon and Canyon Lakes. LB to provide CA with contacts by 9/7.
 - Various schools along the trail. School District facilities and community relations staff as well as representatives from each nearby school should be invited to join the process. LB to provide CA with contacts by 9/7.
 - City of San Ramon and Town of Danville Chambers of Commerce LB/TW to provide CA with contacts by 9/7.
 - BART
 - Iron Horse Advisory Committee - comprised of local residents and business community members who assist the County in improving and managing the corridor and trail. JP to provide member contact information to CA by 9/7.
 - East Bay Area Trails Council (EBATC) JT to provide contact info to CA if available by 9/7.
 - Parks Advisory Committee - includes both the Mayor of Danville and a Council member from San Ramon. LB to provide committee contact to CA by 9/7.
- The local police departments do not monitor the trail; it is patrolled by the EBRPD.
- The trail is a regional facility, so only notifying neighbors is likely to bring out a larger number of people who could oppose trail improvements while omitting the bulk of those who would be served by them.

Meeting Summary

Kick-Off Meeting

RE: IRON HORSE PEDESTRIAN AND BIKE CORRIDOR CONCEPT PLAN

Location of Meeting: San Ramon City Hall

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Item

Person and date to follow up

- Stakeholder meetings are to be held in October. Stakeholders should be notified of meetings by the City and Town through various means including post card mailers, town newsletters, local papers, City websites, and signs posted on the trail at the three crossing locations. LB to provide CA with list of any additional stakeholders not mentioned above by 9/14. CA to prepare postcard mailer.
- Stakeholder meeting should avoid open-ended approach, asking specific questions and emphasizing that this is the first stage of a long range planning effort and development process before these crossings can possibly be constructed. CA to create a schedule of the overall process showing implementation occurring many years in the future for use at stakeholder meetings.
- The next PDT meeting will be held following the stakeholder meetings and is tentatively scheduled for October 29 at 3:00 in the Council Chambers at San Ramon City Hall. All PDT members to attend.

Agency Concerns

- The County is the property owner and is concerned with respecting the interests of the various utility easements that utilize the Iron Horse Corridor. JP to provide Record of Survey drawings showing all utilities and easements to CA by 9/7.
- The County purchased the Iron Horse Corridor with grant money intended for the development of a rail system. If the County ever develops the site in such a way as to prevent its future use for rail transport, they must refund the grant money. There is currently a 30-foot wide easement reserved for future rail use that is delineated on the Record of Survey. Concept Plan to avoid encroachments into the 30' easement.
- Many members of the communities surrounding the Iron Horse Corridor oppose its use for any motorized transit. It was originally identified as a BART line in the Regional Rail Plan. Concept Plan to focus on pedestrian and bicycle use and not to address the issue of rail use. JP to provide CA with a copy of the Regional Rail Plan by 9/7.
- EBRPD is responsible only for a 20' strip of the corridor in which the trail is located. Their primary interest is in improving safety at the major crossing locations.
- Trail and bridges should meet ADA standards for accessibility.
- Question of who will maintain the bridge structures once they are built has not been answered.

Meeting Summary

Kick-Off Meeting

RE: IRON HORSE PEDESTRIAN AND BIKE CORRIDOR CONCEPT PLAN

Location of Meeting: San Ramon City Hall

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Item

Person and date to follow up

-
- If cost of individual pedestrian bridges exceeds \$3-3.5 million, the project will likely encounter a higher level of resistance.
 - This project should be integrated with the design of the San Ramon City Center planned just west of the trail at Bollinger Canyon.
LB to provide CA with City Center plans by 9/7.
 - Traffic studies should account for anticipated use from sites currently being developed along the trail.
LB/TW to provide CA with locations and available plans for any sites currently in planning or construction efforts along the trail, including the commercial development at Sycamore Valley.
 - At this time, the crossings should not be prioritized and no phasing should be recommended as part of the Corridor Concept Plan.
 - Peak weekend use is 8:30-12:00 on Saturdays.
FP to work with LB to identify key areas for weekend use observations to be conducted during this time period.

The information above is Callander Associates' understanding of items discussed and decisions reached at the meeting. Callander Associates is proceeding with the project based on this understanding. If you have any questions, additions, or corrections to this memo, please contact this office in writing within three days.

Submitted by:

Robert Deegan
Callander Associates

cc: All attendees

Emily Johnson, Fehr & Peers e.johnson@fehrandpeers.com

Mahvash Harms, Biggs Cardosa Associates, mharms@biggscardosa.com

Attachment: Project Schedule dated August 30, 2007

IRON HORSE TRAIL

Pedestrian and Bicycle Corridor Concept Plan



Via E-mail Only

October 23, 2007

Community Input Meeting

Location: San Ramon Community Center, 12501 Alcosta Boulevard, San Ramon

Date of Meeting: October 16, 2007

Page 1 of 4

Attendees: *City of San Ramon*

Lauren Barr (LB), Planning/Community Development, Planning Services,

lbarr@sanramon.ca.gov

Lisa Bobadilla (LB), Transportation Division Manager, lbobadilla@sanramonca.gov

Jim Eaneman (JE), Parks and Recreation Commission, jmeaneman@aol.com

Jeff Eorio (JE), Parks and Community Services Director, jeorio@sanramon.ca.gov

Dave Hudson (DH), City Council, dhudson@sanramon.ca.gov

Jim Livingstone (JL), City Council, jwl459@comcast.net

Carol Lopez (CL), Parks and Recreation Commission, cartom@tdl.com

H. Abram Wilson (AW), Mayor, awilson@sanramon.ca.gov

Debbie Chamberlain (DC), Planning Division Manager, dchamberlain@sanramon.ca.gov

Phil Wong (PW), Planning/Community Development Manager, pwong@sanramon.ca.gov

Herb Moniz (HM), City Manager, hmoniz@sanramon.ca.gov

Town of Danville

Bill Lombardi (BL), Commissioner, Park and Recreation, bill.lombardi@clorox.com

Other Attendees:

Louis V. Guzman (LG), East Bay Regional Park District, Trails Supervisor,

cctrails@ebparks.org

Al Olivera (AO), East Bay Regional Park District, aolivera@ebparks.org

Jamie Perkins (JP), East Bay Regional Park District, Regional Trails Department,

jperkins@ebparks.org

Kathy Berner (KB), San Ramon Parks and Community Services Commissioner,

kathyberner@comcast.net

David Ernest (DE), San Ramon Parks and Community Services, davern@pacbell.net

Gina Ferretti (GF), Contra Costa County Board of Supervisors, District III,

gferr@bos.cccounty.us

Supervisor Mary Piepho (MP), Contra Costa County Board of Supervisors, District III,

dist3@bos.cccounty.us

Marci McGuire (MM), Bishop Ranch Transportation Center, marci_brtc@bishopranch.com

Peter Oswald (PO), SRVP Sunset, poswald@bishopranch.com

Consultants:

Mark Slichter, Callander Associates (CA), mslichter@callanderassociates.com

Robert Deegan, Callander Associates (CA), rdeegan@callanderassociates.com



For more information about this project, please call (925) 973-2598

The purpose of this meeting was to inform attendees about the current project to study three overcrossing locations on the Iron Horse Trail, discuss project developments, and gather input including suggestions, endorsements, and concerns for the project.

The following information was discussed and/or decided upon in our meeting:

Attendee question / comment

Response if provided

- | | |
|---|--|
| <ul style="list-style-type: none"> • Have the crossings been prioritized? The Bollinger Canyon crossing may serve the greatest need. | <p>At this time, no priority has been assigned to any of the three crossings.</p> |
| <ul style="list-style-type: none"> • The need for a crossing at Bollinger Canyon is driven not by the proposed San Ramon City Center, but by currently existing uses. The City Center will only add to the current demand. | |
| <ul style="list-style-type: none"> • Traffic volume should be a consideration in prioritizing the crossing locations. This should include both vehicle volume and bicycle and pedestrian counts. | <p>This Study will include an assessment of vehicle, bicycle, and pedestrian traffic volumes at each location, which can be used to prioritize the crossings.</p> |
| <ul style="list-style-type: none"> • What are the current limits of the Study? | <p>This Study will examine the Iron Horse Trail between Sycamore Valley Road and Bollinger Canyon Road, with a focus on the crossings at Sycamore Valley, Crow Canyon, and Bollinger Canyon Roads.</p> |
| <ul style="list-style-type: none"> • Why not include Alcosta Blvd. in the study, either looking at a potential crossing at this location or including vehicle and pedestrian counts for comparative purposes? | <p>Prior to project initiation the CCTA and others identified B, CC and S as the three highest priority crossings for immediate study. Study of additional locations could be part of a future effort.</p> |
| <ul style="list-style-type: none"> • How is the project funded? Has any funding been identified for implementation of the overcrossings if recommended by this Study? | <p>The current project is funded by a Federal T-Plus grant administered by the Contra Costa Transportation Authority. Potential funding sources for implementation include Measure J, which includes funding for pedestrian and bicycle crossings and will become available in 2009, as well as Transportation for Livable Communities (TLC), Metropolitan Transportation Commission (MTC), and additional Federal T-Plus funds.</p> |
| <ul style="list-style-type: none"> • Can the schedule for the study be accelerated? A completed plan could assist the City in planning for the City Center and Citywide park facilities. | <p>If consensus is gained more quickly than anticipated in the current schedule, some acceleration may be possible.</p> |

Meeting Summary – Community Input

Page 3 of 4

Location of Meeting: San Ramon Community Center

Date of Meeting: October 16, 2007

*Attendee question / comment**Response if provided*

- The City is willing to take necessary steps to accelerate the schedule.
- What role does the existing 34-foot wide transit easement play in the planning for the site?

This easement was established by Contra Costa County to provide an easement for potential future light rail in the corridor. The County will likely not allow permanent facilities, including an overcrossing or trail, within the transit corridor.
- Light rail use in the corridor is not advocated by the City of San Ramon or the Town of Danville. Can the study recommend the elimination of the transit easement in the Iron Horse Trail corridor?

This easement must be maintained by the County because the property was purchased with grant money dedicated to mass transit projects. If light rail use is eliminated, the County may be required to refund the grant money.
- Because the trail is very well used, conflicts between various types of users are common. Many bikers prefer to ride on the streets rather than riding at limited speeds on the corridor. Could a separate bicycle trail be provided along side the current trail?

The corridor is too constrained to accommodate separate dedicated trails. Constraints include easements for future light rail (34') and multiple utilities including gas transmission lines, fiber optics, and high voltage electrical transmission lines.
- Do the overcrossings need to accommodate future light rail use?

The overcrossings in this study are intended for trail use only and will not accommodate light rail.
- The EBRPD produced a study in 1997 examining use of the trail. This study concluded that the primary use was to get between schools, shops and residences.
- It would be useful to determine what percentage of people are commuting longer distances on the trail.
- There is a significant transit facility (West Dublin BART station) being constructed outside the limits of the project which will likely impact trail use.
- The EBRPD has recently constructed two similar crossings along the Iron Horse Trail. These crossings have been very well received--4,000 people showed up for the dedication of the Ignacio Valley Boulevard crossing--and are well used.

Meeting Summary – Community Input
Page 4 of 4

Location of Meeting: San Ramon Community Center
Date of Meeting: October 16, 2007

Attendee question / comment

Response if provided

- Construction of a new overcrossing allows for uninterrupted flow of both pedestrians/bicyclists and vehicles, improving efficiency and convenience for both.
- Pedestrian and Bicyclist counts should be scheduled for sunny days as many more people use the trail during favorable weather.
- Counts need to account for future use generations from City Center.
- Can at-grade crossings be eliminated if the overcrossings are constructed?
- Direct access, via stairways if necessary, should be provided from the roadway to the overcrossing without requiring users to backtrack to the beginning of the overcrossing ramp. The BART pedestrian bridge at the Coliseum provides an example of this type of access.
- Can study recommend elimination of mass transit use in trail corridor?

Counts will be scheduled.

Figures from the traffic study conducted for the City Center will be utilized in the study to account for the anticipated increase in use.

At-grade crossings would still be necessary at Sycamore Valley and Bollinger Canyon Roads because there are existing intersections at those locations. The mid-block crossing could likely be eliminated at Crow Canyon Road.

The information above is Callander Associates’ understanding of items discussed and decisions reached at the meeting. Callander Associates is proceeding with the project based on this understanding. If you have any questions, additions, or corrections to this memo, please contact this office in writing within three days.

Submitted by:

Robert Deegan
Callander Associates

cc: All attendees
Tai Williams, Town of Danville, twilliams@ci.danville.ca.us
Jim Townsend, East Bay Regional Parks District, jtownsend@ebparks.org
John Pulliam, Contra Costa County, jpull@pw.cccounty.us
Brad Beck, Contra Costa Transportation Authority, bbeck@ccta.net
Emily Johnson, Fehr & Peers, e.johnson@fehrandpeers.com
Mahvash Harms, Biggs Cardosa Associates, mharms@biggs-cardosa.com

IRON HORSE TRAIL

Pedestrian and Bicycle Corridor Concept Plan



Via E-mail Only

November 13, 2007

Project Development Team Meeting #2

Location: San Ramon City Hall

Date of Meeting: November 6, 2007

Page 1 of 5

Attendees: *Project Development Team (PDT):*

Lisa Bobadilla (LB), Transportation Division Manager, City of San Ramon,
lbobadilla@sanramonca.gov

Lauren Barr (LBa), City of San Ramon, lbarr@sanramon.ca.gov

Tai Williams (TW), Town of Danville, twilliams@ci.danville.ca.us

John Pulliam (JP), Contra Costa County Public Works, jpull@pw.cccounty.us

Consultants:

Mark Slichter, Callander Associates (CA), mslichter@callanderassociates.com

Robert Deegan, Callander Associates (CA), rdeegan@callanderassociates.com

Emily Johnson, Fehr & Peers (FP), e.johnson@fehrandpeers.com

The purpose of this meeting was to update the PDT on recent project developments, review community comments, traffic counts, and project constraints, and develop a strategy for moving ahead with the Study.

The following information was discussed and/or decided upon in our meeting:

Item

Person and date to follow up

Review of Community Input Meeting (10/16/07)

- The City of San Ramon had requested that the project schedule be accelerated if possible. This will allow the project to be submitted in a draft form for additional T-Plus funds, applications for which are due in March of 2008. A revised schedule was distributed at the meeting that accelerates the project by shortening several tasks and initiating the exploration of overcrossing design alternatives while the traffic study is still underway.



For more information about this project, please call (925) 973-2598

Meeting Summary - PDT Meeting #2
Page 2 of 5

Location of Meeting: San Ramon City Hall
Date of Meeting: November 6, 2007

Item

Person and date to follow up

- It had been requested that this study give some priority to the three crossing locations. However, the purpose of this study is to develop a concept for all three crossings. Priority will be assigned by the individual municipalities that govern these crossings and by the availability of funding.

Context Map

- Callander Associates presented a context map showing key use generating facilities along the study segment of the Iron Horse Trail to facilitate future discussions and meetings. Members of the PDT were asked to provide any comments on the readability and completeness of the map. All PDT members to provide full comments on the context map (attached) by 11/14.
- Major arterials and Hwy. 680 should be identified as black; trail should be changed to green. CA to revise.
- Various phases of Bishop Ranch should be separately identified. CA to add.
- Connections to on-street bike facilities should be noted. CA to add.
- FP prepared a similar, but more detailed map for use with their traffic study. The map prepared by CA is simpler and should be used for public discussions.

Traffic Data

- FP distributed results from pedestrian and bicycle counts from four locations along the trail. Counts were conducted on Tuesday, October 23 at 8-9 AM, 3-4 PM, and 4-5 PM; on Saturday October 27 at 10-11 AM; on Wednesday October 31 at 7:30-8:30 AM, 2-3 PM, and 5:30-6:30 PM; and on Saturday November 3 at 10-11 PM. A summary of the accounts is attached.
- Highest Saturday use appears to be at El Capitan Drive. This site also would likely have the highest weekday counts because of the proximity of schools.
- The Sycamore Valley Road (SVR), Crow Canyon Road (CCR) and Bollinger Canyon Road (BCR) crossings act as barriers or turn-around points. Counts at these locations could be expected to increase with the construction of overcrossings, which would effectively remove the barrier. Current counts should be considered a baseline for potential future use. FP to factor into demand forecast.

Meeting Summary - PDT Meeting #2
Page 3 of 5

Location of Meeting: San Ramon City Hall
Date of Meeting: November 6, 2007

Item

Person and date to follow up

- Some data regarding an increase in trail use due to the construction of an overcrossing may be available from the recent overcrossing constructed on the Iron Horse Trail at Ygnacio Valley Road in Walnut Creek.

FP to contact John Hall to request information by 11/21.
- Additional Data regarding cyclists during the commute and lunchtime hours may be available from Marci at Bishop Ranch as well as AT&T and Chevron. This data could include annual ridership as well as bicycle locker rental rates. Locker rentals at the San Ramon Transit Center should also be considered.

LB to provide contact info to CA for AT&T and Chevron bicycle representatives by 11/16. CA/FP to contact representatives for data by 11/21. FP to factor data into demand forecast.
- FP observed many jaywalkers at study crossings.

FP to include in assessment of corridor safety issues.
- The daily vehicle count of 53,000 on CCR west of Hwy. 680 was higher than expected. It would be interesting to compare this number to the daily count on CCR west of BCR.

FP to verify accuracy of count. LB to check City records for a recent count west of BCR.
- Trail use is currently highest on Saturday, but weekday use may grow more rapidly due to development of the San Ramon City Center and increasing use of non-motorized transit for commutes to work and school.

FP to address in demand forecast.
- Danville has recent pedestrian and bicycle counts for the Iron Horse Trail at Del Amigo Road and San Ramon has recent counts at Montevideo Drive. This data could be useful in assessing the overall use of the trail.

LB and TW to provide to FP by 11/16.
- San Ramon Central Park, Iron Horse Middle School, and California High School are all major use generators at the BCR crossing. FP observed the California High School cross-country team using the trail at this location.
- Establishment of Bicycle and Pedestrian desire lines should note origins and destinations rather than precise paths of travel. Emphases should be on new developments. "Desire Lines" may not be the most appropriate name for this portion of the study.

FP to address in traffic study.
- New developments planned along the Iron Horse Trail include the San Ramon City Center, The Rose Garden development in Danville, a new 30-40 unit Condo development north of CCR, and a new 8-10 unit detached housing development near Osage Park that will also provide a trail connection to the park.

TW to provide CA with plans for the Osage housing development by 11/16.

Meeting Summary - PDT Meeting #2
Page 4 of 5

Location of Meeting: San Ramon City Hall
Date of Meeting: November 6, 2007

Item

Person and date to follow up

Project Constraints

- The corridor is heavily constrained by existing utilities and a 34-foot wide transit corridor dedicated to future light rail use.
- No alternative should be “off the table” for this feasibility study. All alternatives should be considered and the pros and cons noted for each. A final decision as to which alternatives to pursue further will be made by policy makers. Alternatives to be considered include:
 - Locating the overcrossings within the transit corridor (this could include a commitment by the City or Town to remove the overcrossings if rail is developed in the future).
 - Relocating utilities.
 - Relocating the transit corridor (if the transit corridor is relocated over utilities, this could include a commitment by the City or Town to fund the relocation of those utilities when rail is developed).
 - Locating the overcrossings outside the Iron Horse Trail corridor (if property acquisition is required, study should clearly state that this alternative would be conditioned on the City or Town acquiring the needed property prior to implementation of the project).
- The precise location and depth of the various utility lines within their easements is not known by the County or the respective utility companies.
- Information regarding the size of each of the utilities located within the corridor would indicate the cost implications of relocating the various utilities and will assist in selecting the most financially feasible alternative for locating the overcrossings.

CA to provide multiple alternatives for each overcrossing location with a clear summary of pros and cons for each alternative.

JP to provide utility size information along with updated record of survey to CA by 11/19.

Schedule

- PDT #3 will include assessment of overcrossing alternatives and a review of the preliminary Corridor Concept Plan. This meeting is currently scheduled for late January but should be accelerated if possible. Biggs Cardosa should be included in PDT#3.

CA/FP to accelerate tasks where possible to move PDT#3 up to mid-January. CA to notify Biggs Cardosa to attend PDT#3.

Meeting Summary - PDT Meeting #2
Page 5 of 5

Location of Meeting: San Ramon City Hall
Date of Meeting: November 6, 2007

Item

Person and date to follow up

- Public Workshops will not be held until the initial concepts have been presented to the San Ramon City Council and Danville Town Council.
- CA to work with LB/TW to schedule these Council meetings. CA to revise schedule to reflect these meetings.

The information above is Callander Associates' understanding of items discussed and decisions reached at the meeting. Callander Associates is proceeding with the project based on this understanding. If you have any questions, additions, or corrections to this memo, please contact this office in writing within three days.

Submitted by:

Robert Deegan
Callander Associates

Attach: Context Map
Traffic Count Summary

cc: All attendees
Jim Townsend, East Bay Regional Parks District, jtownsend@ebparks.org
Brad Beck, Contra Costa Transportation Authority, bbeck@ccta.net
Mahvash Harms, Biggs Cardosa Associates, mharms@biggscardosa.com

IRON HORSE TRAIL

Pedestrian and Bicycle Corridor Concept Plan



Via E-mail Only

January 17, 2008

Project Development Team Meeting #3

Location: San Ramon City Hall

Date of Meeting: January 16, 2008

Page 1 of 5

Attendees: *Project Development Team (PDT):*

Lisa Bobadilla (LB), Transportation Division Manager, City of San Ramon,
lbobadilla@sanramonca.gov

Lauren Barr (LBa), City of San Ramon, lbarr@sanramon.ca.gov

Tai Williams (TW), Town of Danville, twilliams@ci.danville.ca.us

John Pulliam (JP), Contra Costa County Public Works, jpull@pw.cccounty.us

Jim Townsend (JT), East Bay Regional Park District, jtownsend@ebparks.org

Consultants:

Mark Slichter, Callander Associates (CA), mslichter@callanderassociates.com

Colleen Salveson, Callander Associates (CA), csalveson@callanderassociates.com

Emily Johnson, Fehr & Peers (EJ), e.johnson@fehrandpeers.com

The purpose of this meeting was to review and present to the PDT recent project developments, traffic counts study and bridge alignment ideas.

The following information was discussed and/or decided upon in our meeting:

Item

Person and date to follow up

Review of PDT#2 (11/6/07)

- The grant funding available is from Transportation Planning Land Use (TPLUS). The Contra Costa Transportation Authority (CCTA) has recommended TPLUS applications of \$200,000 or more. LB to get TPLUS application to CA

Context Map

- Callander Associates presented the revised context map showing key use generators along the Iron Horse Trail. Members of the PDT were asked to provide any comments on the readability and completeness of the map. All PDT members to provide full comments on the context map by 1/26



For more information about this project, please call (925) 973-2598

Meeting Summary - PDT Meeting #3
Page 2 of 5

Location of Meeting: San Ramon City Hall
Date of Meeting: January 16, 2008

*Item**Person and date to follow up*

- The “On Street Bike Lanes” should be labeled by type (Class I,II, III)
- Parts of the “On Street Bike Lanes” are incorrect.

CA to revise.

TW to give edits to CA

Project Schedule

- The project schedule has been updated – PDT#4 is scheduled for February 27 at 3:30.
- The intent is to present bridge concepts and supporting data to the city and town councils.
- Concepts and data will be provided to the City for their use in applying for TEA-Plus funding.

Traffic Data

- EJ distributed results from pedestrian and bicycle counts from four locations along the trail.
- FP will receive data shortly from CHP concerning collisions at the various crossings. There have been three reported collisions at the Crow Canyon intersection between 2002-2007.
- Long signals at the various crossings led many pedestrians to jay-walk.
- Near the Sycamore intersection, Northbound Camino Ramon has a poor driver visibility towards the Sycamore crossing.
- At Bollinger (eastbound) many cars back up into the intersection, leading pedestrians to jay-walk.
- EJ reported that there were not many children using the crossings. It was thought that most children were traveling in between the crossings and not through them.
- The Sycamore Valley Road (SVR), Crow Canyon Road (CCR) and Bollinger Canyon Road (BCR) crossings act as barriers or turn-around points. 25% of trail users turn around at the crossings. Counts at these locations could be expected to increase with the construction of overcrossings, which would effectively remove the barrier.
- The highest percent of increase in future volumes were predicted to be at Crow Canyon during peak hours. Many felt this prediction seemed high. JT also pointed out the during summer

FP to add data to study

FP to check distribution totals for Crow Canyon future volumes.

Meeting Summary - PDT Meeting #3
Page 3 of 5

Location of Meeting: San Ramon City Hall
Date of Meeting: January 16, 2008

*Item**Person and date to follow up*

months the entire trail will be heavily used between 7-9PM.

- It was pointed out that for vehicles traveling to the new City Center, they will likely turn before going through the IHT crossing.
- Access to adjacent land uses, such as Central Park at Bollinger Canyon Road needs to be considered when planning the various bridge crossings.
- One Level of Service (LOS) methodology should be used for all studies. CCTALOS is the recommended methodology because it is the CCTA's approved methodology and jurisdictions located in Contra Costa County, including the SR City Center Project, have used this methodology.
- It was discussed to consider removing the at-grade crossings at Crow Canyon if a bridge is implemented. This will provide a smoother traffic flow.
- Pedestrians being re-routed and back-tracking due to new bridge overcrossings should be considered. Providing stairs to get across, such as at the Ygnacio Bridge, located in Walnut Creek is a possible solution.
- The 'projected growth in trail use and vehicle volumes chart' should be simplified.

FP to use CCTALOS methodology.

FP to edit chart.

Crossings/Alignments

- CA presented possible bridge alignments for the various crossings, and explained the pro's and con's with each layout.
- JP verified that the transit corridor is a 34' wide placeholder that is able to be shifted around. This will provide for more flexibility when investigating different bridge alignments. It should still not be placed over easements, however if it is already shown over an easement (such as at Crow Canyon), it can encroach further.
- **Sycamore Crossing Alignment:**
 - Alternative A: JT believes it will not be a problem to cross over the transit corridor to tie the bridge back to the trail. JP doesn't think it is ideal to place the bridge adjacent to KM line (KM gas line easement location is not precisely known) JP said a 4' overlap with transit corridor is feasible.

JP to verify if any easements or obstructions were missed.

Meeting Summary - PDT Meeting #3
Page 4 of 5

Location of Meeting: San Ramon City Hall
Date of Meeting: January 16, 2008

Item

Person and date to follow up

- Alternative B: TW pointed out that the structure would be very close to homes and could meet with community resistance; however both options should still be shown.

- **Crow Canyon Crossing Alignment:**
 - Proposed Alignment: It is preferable that the bridge links up with the trail. There are homes nearby that could object to a bridge being built because it would impact their view. TW to check the vertical clearance requirements and give information to CA.

- **Bollinger Canyon Crossing Alignment:**
 - The Alignment Alternatives Preliminary Plan shows that the bridge alignments are similar, with A being on the south side of the storm drain easement, and B being on the north side.
 - The close proximity of the crossing to homes may create a conflict for residents.
 - It is important to have an access point from the bridge to the City Center and to the adjacent park.
 - The bridge should be lined up with the trail.

- Images/Illustrations of the various bridge crossings should be created to further design concepts. CA to create illustrations/drawings of the proposed bridges.

Bridge Reference Imagery

- The image of the brick bridge with weathered steel was preferred and thought to be well suited for the Sycamore Crossing.

- The glass/steel/cable imagery was thought to be appropriate for the Bollinger Canyon Crossing. LB liked the Sun-Dial bridge appearance. It was mentioned that the council may want the bridge to relate to the overcrossing at the golf course on Bollinger, however this look is very different than the proposed City Center design. CA to look at Treat Bridge, and City of Davis Bridges.

- It was agreed that the Crow Canyon Crossing should have a stone Bokay Canyon element incorporated in its design, such as some similar images show. Everyone to give images or material ideas for all bridge crossings to CA by 2/1

- All comments related to the crossing/alignments should be forwarded to CA by February 1, 2008

Meeting Summary - PDT Meeting #3
Page 5 of 5

Location of Meeting: San Ramon City Hall
Date of Meeting: January 16, 2008

Item

Person and date to follow up

The information above is Callander Associates' understanding of items discussed and decisions reached at the meeting. Callander Associates is proceeding with the project based on this understanding. If you have any questions, additions, or corrections to this memo, please contact this office in writing within three days.

Submitted by:

Colleen Salvesson
Callander Associates

cc: All attendees
Brad Beck, Contra Costa Transportation Authority, bbeck@ccta.net
Mahvash Harms, Biggs Cardosa Associates, mharms@biggscardosa.com

IRON HORSE TRAIL

Pedestrian and Bicycle Corridor Concept Plan



Via E-mail Only

February 28, 2008

Project Development Team Meeting #4

Location: San Ramon City Hall

Date of Meeting: February 28, 2008

Page 1 of 4

Attendees: *Project Development Team (PDT):*

Lisa Bobadilla (LB), Transportation Division Manager, City of San Ramon,
lbobadilla@sanramonca.gov

Lauren Barr (LBa), City of San Ramon, lbarr@sanramon.ca.gov

Tai Williams (TW), Town of Danville, twilliams@ci.danville.ca.us

Jim Townsend (JT), East Bay Regional Park District, jtownsend@ebparks.org

Consultants:

Mark Slichter, Callander Associates (CA), mslichter@callanderassociates.com

Colleen Salveson, Callander Associates (CA), csalveson@callanderassociates.com

Emily Johnson, Fehr & Peers (FP), e.johnson@fehrandpeers.com

The purpose of this meeting was to review and present to the PDT recent project developments, traffic counts study and bridge concept ideas.

The following information was discussed and/or decided upon in our meeting:

Item

Person and date to follow up

Review of PDT#2 (11/6/07)

- TPLUS applications are due April 30, and \$100,000 will be requested.

LB to get TPLUS application to CA.

Project Schedule

- The IHT Corridor Concept Report will be taken to San Ramon City Council on Tuesday, April 8 and Danville Town Council on Tuesday, April 15.
- Staff reports are due 10 days before going to council.

CA will give Corridor Concept Report to LB by 3/26 for review.



For more information about this project, please call (925) 973-2598

Meeting Summary - PDT Meeting #4

Page 2 of 4

Location of Meeting: San Ramon City Hall

Date of Meeting: February 27, 2008

*Item**Person and date to follow up*

- PDT #5 is scheduled for Wednesday, March 19 from 1:30-3PM in the Planning Conference Room.

Traffic Data

- FP presented minor changes in the description of traffic counts and reviewed the changes per JT comments. An updated "Corridor Concept Plan" was distributed.
- Many were concerned that the data indicated lower usage figures than the perceived level of use.
- Re-evaluating the traffic and use data could shed light on usage. More focus should be given to improving vehicle traffic and more qualitative projections should be made
- It was decided that FP data will investigate the Bollinger Canyon Road crossing using SYNCHRO methodology.
- The report should emphasize a high priority on improving pedestrian safety.
- FP explained that the history of the Ygnacio Bridge was researched, and there was no feasibility study or data gathered pertaining to the bridge development.

FP to analyze data at Bollinger using SYNCHRO.

Corridor Concept Report

- TW asked that the report should show the direct benefit to the community through the bridge development.
- LB suggested that showing annual use rather than 'peak hour' use could be beneficial for making a larger statement about the use that currently occurs along the trail.
- TW stated that the report needs to focus on one crossing (possibly Bollinger), be qualitative, provide annual data and site case studies.
- Case studies and previous pedestrian bridge overcrossings should be investigated.

CA will include planner and user info in the report.

LB will contact Contra Costa County and gather information on the Treat Overcrossing.

CA will gather information on overcrossings in San Jose.

JT will investigate the Antioch Bridge development.

Meeting Summary - PDT Meeting #4
Page 3 of 4

Location of Meeting: San Ramon City Hall
Date of Meeting: February 27, 2008

Item

Person and date to follow up

- The report should include the importance of transit oriented development for these crossings.
- There are plans to widen Bollinger to 4 lanes total, 2 on each side, as well as a Bishop Drive extension.
- With more lanes on Bollinger, signal time will increase and traffic will increase, indicating that an overcrossing will be more beneficial after the widening.

LB will investigate the Mokelumne Bridge development.

LB to give CA the Bollinger Road widening plans.

CA to revise Bollinger crossing with new roads. Bollinger bridge span will be increased.

Bridge Concepts

- CA presented possible bridge concepts for the various crossings, providing a starting point for discussion on their aesthetics and feasibility.
- **Sycamore Bridge Concept:**
 - It was thought that the brick and column appearance was good and fit well with its surroundings. LBA pointed out that having wood decking on any bridge can be a maintenance problem.
- **Crow Canyon Bridge Concept:**
 - TW thought the concept provided a good mesh between San Ramon and Danville.
- **Bollinger Bridge Concept:**
 - This bridge would be the most custom of the three.
 - JT explained that glass siding could be a maintenance issue, and is easily vandalized. Having an open mesh wire on the sides of the bridge is a possible alternative that could maintain the transparency.
 - LBA mentioned that the glass could be reflective and could impair drivers' vision.

Meeting Summary - PDT Meeting #4
Page 4 of 4

Location of Meeting: San Ramon City Hall
Date of Meeting: February 27, 2008

Item

Person and date to follow up

- It was thought that stairs at this location would be the most beneficial.
- Providing multiple designs to take to council and the public meetings was discussed.

CA to study the feasibility of including stairs at Bollinger.

LB will circulate the bridge concepts to the planning department and respond.

CA will email 'Draft Bridge Concepts' to all PDT members.

CA will provide preliminary costs at the next PDT.

All PDT members to provide comment by 3/7/08

The information above is Callander Associates' understanding of items discussed and decisions reached at the meeting. Callander Associates is proceeding with the project based on this understanding. If you have any questions, additions, or corrections to this memo, please contact this office in writing within three days.

Submitted by:

Colleen Salvesson
Callander Associates

cc: All attendees
John Pulliam (JP), Contra Costa County Public Works, jpull@pw.cccounty.us
Brad Beck, Contra Costa Transportation Authority, bbeck@ccta.net
Mahvash Harms, Biggs Cardosa Associates, mharms@biggs-cardosa.com

Attachment: Draft Bridge Concepts (4 pages), 2/27/08

IRON HORSE TRAIL

Pedestrian and Bicycle Corridor Concept Plan



Via E-mail Only

March 20, 2008

Project Development Team Meeting #5

Location: San Ramon City Hall

Date of Meeting: March 19, 2008

Page 1 of 4

Attendees: *Project Development Team (PDT):*

Lisa Bobadilla (LB), Transportation Division Manager, City of San Ramon,
lbobadilla@sanramonca.gov

Lauren Barr (LBa), City of San Ramon, lbarr@sanramon.ca.gov

John Pulliam (JP), Contra Costa County Public Works, jpull@pw.cccounty.us

Jenna Caldwell (JC) Contra Costa County Public Works, jcald@pw.cccounty.us

Consultants:

Mark Slichter, Callander Associates (CA), mslichter@callanderassociates.com

Colleen Salveson, Callander Associates (CA), csalveson@callanderassociates.com

Emily Johnson, Fehr & Peers (FP), e.johnson@fehrandpeers.com

Mahvash Harms, Biggs Cardosa Associates, mharms@biggscardosa.com

The purpose of this meeting was to review and present to the PDT recent project developments: the SYNCHRO traffic data, and IHT Draft Corridor Concept Report.

The following information was discussed and/or decided upon in our meeting:

Item

Person and date to follow up

Review of PDT#2 (11/6/07)

- TEA PLUS applications are due April 30, and \$100,000 will be requested to proceed with preliminary engineering.

LB to compare report with application requirements

General

- Qualitative information will be necessary in the Concept Report.
- The Bollinger Widening Plans have been incorporated in the SYNCHRO data and all concept drawings in the report.

LB and FP will verify if the "Bollinger Widening Plan" is to be used, or if the "City Center Widening Plan" is to be used



For more information about this project, please call (925) 973-2598

Meeting Summary - PDT Meeting #5
Page 2 of 4

Location of Meeting: San Ramon City Hall
Date of Meeting: March 19, 2008

Item

*Person and date to follow up
for traffic data and concepts.*

Traffic Data – SYNCHRO Analysis

- FP presented traffic data using the SYNCHRO methodology.
- Peak hour figure was used at Bollinger Canyon and it was found that overcrossings would reduce vehicle delays by at least 35 seconds.
- It was mentioned that the SYNCHRO methodology could be inconsistent with the City Center traffic data methodology.
- Having a display showing the proposed Bollinger overcrossing and a survey about trail use at the crossings on “Bike to Work Day” – May 16, is an option that the City of San Ramon may pursue. “Bike to Work Day” Surveys could be conducted and if accepted, data information can be added in the appendix of the report. The data would not be able to be incorporated into the report before it goes to council or public meetings.
- Reaching out to advocates of the overcrossings could provide an indication of significant support for the overcrossings.
- FP explained that the history of the Ygnacio Bridge was researched, and there appears that there was no feasibility study or data gathered pertaining to the bridge development. The bridge came about as a result of the advocacy of individuals.

LB and FP will decide how to incorporate both methodologies, and will provide explanation for methodology choice in report.

LB to provide FP with most recent information regarding Bollinger widening

Draft Corridor Concept Report

- CA presented the draft corridor concept report, explaining the new illustrations, cost estimates and data.
- Case studies should be added to the report
- Safety should be a more prominent element of the report.
- It was decided that the Architect for the City Center should be approached about submitting a sketch for the Bollinger Bridge,

CA to add case studies to the Concept Report.

CA to elaborate on safety as a part of the Concept Report.

LB/LBa to ask Architect for a rendering of a bridge for the

Meeting Summary - PDT Meeting #5

Page 3 of 4

Location of Meeting: San Ramon City Hall

Date of Meeting: March 19, 2008

Item

generating more bridge design options for the overcrossing

Person and date to follow up

Bollinger overcrossing.

- Language from previous reports, such as the San Ramon General Plan, that describe City, Town or Organizations that support and encourage bike accessibility and trail projects should be added.
- Community support is important for this project. Include information from surrounding groups such as the Twin Peaks area, and cycle teams (Chevron).
- The Tri-Valley Transportation Plan is being updated which includes emphasis on carpooling, and bicycling.
- The 100 acres around the proposed City Center is a "Priority Development Area" (PDA) as designated by ABAG. POC's would be favorably viewed.
- It is important to find out who will be maintaining the proposed overcrossings. Finding information about the cost of maintaining the bridges will be necessary.
- The 'Use Generator' List in the report should include population numbers for the various areas.
- The City Center Plan in the report should be labeled with the different entities.
- MH proposed cantilever stairs for Sycamore and Bollinger crossings, to prevent less encroachment into the easements.

CA to include language from various documents describing bike/pedestrian trail improvements/goals.

LB to gather information from surrounding groups about proposed overcrossings.

CA to cite Tri-Valley Transportation Plan as a reference in the report.

LB will ask JT about parcel tax.

CA will gather information about San Jose overcrossing maintenance costs.

CA to add population numbers to list.

CA to add a City Center Plan with labels to the report.

MH to provide CA with sketch of cantilever stairs on bridges.

Project Schedule

- The draft final report will be submitted to councils around the end of April/beginning of May. The public meetings would then be scheduled for June.
- Comments on the Draft Corridor Concept Report are due by April

LB to verify council dates with CA.

LB will confirm technical data for FP by 3/28

PDT members to provide comments to CA by 4/4/08

Meeting Summary - PDT Meeting #5

Page 4 of 4

Location of Meeting: San Ramon City Hall

Date of Meeting: March 19, 2008

Item

4, 2008.

Person and date to follow up

CA to distribute electronic

The information above is Callander Associates' understanding of items discussed and decisions reached at the meeting. Callander Associates is proceeding with the project based on this understanding. If you have any questions, additions, or corrections to this memo, please contact this office in writing within three days.

Submitted by:

Colleen Salvesson

Callander Associates

cc: All attendees

Tai Williams (TW), Town of Danville, twilliams@ci.danville.ca.us

Jim Townsend (JT), East Bay Regional Park District, jtownsend@ebparks.org

Brad Beck, Contra Costa Transportation Authority, bbeck@ccta.net

Preliminary Draft Estimate of Probable Project Costs

prepared for the
City of San Ramon and the Town of Danville

**Iron Horse Trail
Bowstring Truss**

prepared on: 5/23/08
prepared by: CS
checked by: MS

Item #	Description	Qty	Unit	Cost	Item Total	Subtotal
A	Project Start-up					
1.	Bonding and mobilization	Allow	3%	\$130,689.00	\$130,689.	
2.	Construction staking	Allow	LS	\$10,000.00	\$10,000.	
3.	Temporary fencing	1,300	LF	\$3.00	\$3,900.	
4.	Tree pruning/protection	Allow	LS	\$2,500.00	\$2,500.	
5.	Traffic control	Allow	LS	\$25,000.00	\$25,000.	
6.	Utility mapping	Allow	LS	\$5,000.00	\$5,000.	
						\$177,090.
B	Demolition					
1.	Clearing and grubbing	Allow	LS	\$2,500.00	\$2,500.	
2.	Tree removal	Allow	LS	\$2,500.00	\$2,500.	
3.	Utility adjustments	Allow	LS	\$6,000.00	\$6,000.	
3.	Asphalt path	Allow	LS	\$30,000.00	\$30,000.	
3.	Fencing	Allow	LS	\$300.00	\$300.	
						\$41,300.
C	Bridge Construction					
1.	Prefabricated bridge	150	LF	\$4,000.00	\$600,000.	
2.	Abutment	4	EA	\$250,000.00	\$1,000,000.	
3.	Bridge ramps	200	LF	\$4,000.00	\$800,000.	
3.	Shorter spans	400	LF	\$3,600.00	\$1,440,000.	
5.	Approaches	200	LF	\$2,000.00	\$400,000.	
						\$4,240,000.
D	Site Construction					
1.	Directional/regulatory interpretive signage, fencing, striping	Allow	LS	\$15,000.00	\$15,000.	
2.	Asphalt paving	Allow	LS	\$20,000.00	\$20,000.	
2.	Concrete paving	Allow	LS	\$5,000.00	\$5,000.	
						\$40,000.
E	Lighting					
1.	Uplighting	Allow	LS	\$10,000.00	\$10,000.	
2.	Security lighting	Allow	LS	\$25,000.00	\$25,000.	
						\$35,000.
F	Construction Total					\$4,533,390.
G	Contingency	Allow	10%	\$453,339.00	\$453,339.	\$453,340.
H	City Administration					
1.	Design phase	Allow	15%	\$680,008.50	\$680,009.	
2.	Construction phase	Allow	10%	\$453,339.00	\$453,339.	
						\$1,133,348.
I	Professional Services					
1.	Boundary survey with utilities	Allow	LS	\$20,000.00	\$20,000.	
2.	Structural engineering	Allow	LS	\$400,000.00	\$400,000.	
3.	Electrical engineering	Allow	0.5%	\$24,933.65	\$24,934.	
4.	Geotechnical engineering	Allow	LS	\$20,000.00	\$20,000.	
5.	Site planning/landscape architecture	Allow	3%	\$149,601.90	\$149,602.	
6.	Construction management	Allow	4%	\$199,469.20	\$199,469.	
						\$814,000.
J	Permitting					
1.	Regulatory agency permit fees	Allow	2%	\$99,734.60	\$99,735.	
						\$99,730.
K	Total Project Cost					\$7,033,808.
L	Exclusions					

Preliminary Draft Estimate of Probable Project Costs

prepared for the
City of San Ramon and the Town of Danville

**Iron Horse Trail
Bowstring Truss**

prepared on: 5/23/08
prepared by: CS
checked by: MS

Item #	Description	Qty	Unit	Cost	Item Total	Subtotal
	utility relocation, inflation, all other costs					
	Based on drawing entitled "Potential Bridge Concepts", dated "5/23/08"					
	The above items, amounts, quantities, and related information are based on Callander Associates' judgment at this level					
	of document preparation and is offered only as reference data. Callander Associates has no control over construction quantities,					
	costs and related factors affecting costs, and advises the client that significant variation may occur between					
	this estimate of probable construction costs and actual construction prices.					

Preliminary Draft Estimate of Probable Project Costs

prepared for the
City of San Ramon and the Town of Danville

**Iron Horse Trail
Box Truss**

prepared on: 5/23/08
prepared by: CS
checked by: MS

Item #	Description	Qty	Unit	Cost	Item Total	Subtotal
A	Project Start-up					
1.	Bonding and mobilization	Allow	3%	\$106,989.00	\$106,989.	
2.	Construction staking	Allow	LS	\$10,000.00	\$10,000.	
3.	Temporary fencing	1,300	LF	\$3.00	\$3,900.	
4.	Tree pruning/protection	Allow	LS	\$2,500.00	\$2,500.	
5.	Traffic control	Allow	LS	\$25,000.00	\$25,000.	
6.	Utility mapping	Allow	LS	\$5,000.00	\$5,000.	
						\$153,390.
B	Demolition					
1.	Clearing and grubbing	Allow	LS	\$2,500.00	\$2,500.	
2.	Tree removal	Allow	LS	\$2,500.00	\$2,500.	
3.	Utility adjustments	Allow	LS	\$6,000.00	\$6,000.	
4.	Asphalt path	Allow	LS	\$30,000.00	\$30,000.	
5.	Fencing	Allow	LS	\$300.00	\$300.	
						\$41,300.
C	Bridge Construction					
1.	Prefabricated bridge	130	LF	\$3,000.00	\$390,000.	
2.	Abutment	2	EA	\$250,000.00	\$500,000.	
3.	Bridge ramps	600	LF	\$3,600.00	\$2,160,000.	
4.	Approaches	200	LF	\$2,000.00	\$400,000.	
						\$3,450,000.
D	Site Construction					
1.	Directional/regulatory interpretative signage, fencing, striping	Allow	LS	\$15,000.00	\$15,000.	
2.	Asphalt paving	Allow	LS	\$20,000.00	\$20,000.	
3.	Concrete paving	Allow	LS	\$5,000.00	\$5,000.	
						\$40,000.
E	Lighting					
1.	Uplighting	Allow	LS	\$10,000.00	\$10,000.	
2.	Security lighting	Allow	LS	\$25,000.00	\$25,000.	
						\$35,000.
F	Construction Total					\$3,719,690.
G	Contingency	Allow	10%	\$371,969.00	\$371,969.	\$371,970.
H	City Administration					
1.	Design phase	Allow	15%	\$557,953.50	\$557,954.	
2.	Construction phase	Allow	10%	\$371,969.00	\$371,969.	
						\$929,923.
I	Professional Services					
1.	Boundary survey with utilities	Allow	LS	\$20,000.00	\$20,000.	
2.	Structural engineering	Allow	LS	\$320,000.00	\$320,000.	
3.	Electrical engineering	Allow	0.5%	\$20,458.30	\$20,458.	
4.	Geotechnical engineering	Allow	LS	\$20,000.00	\$20,000.	
5.	Site planning/landscape architecture	Allow	3%	\$122,749.80	\$122,750.	
6.	Construction management	Allow	4%	\$163,666.40	\$163,666.	
						\$666,870.
J	Permitting					
1.	Regulatory agency permit fees	Allow	2%	\$81,833.20	\$81,833.	
						\$81,830.
K	Total Project Cost					\$5,770,283.

Preliminary Draft Estimate of Probable Project Costs

prepared for the
City of San Ramon and the Town of Danville

**Iron Horse Trail
 Box Truss**

prepared on: 5/23/08
 prepared by: CS
 checked by: MS

Item #	Description	Qty	Unit	Cost	Item Total	Subtotal
L	Exclusions					
	Utility relocation, inflation, all other costs					
	Based on drawing entitled "Potential Bridge Concepts, dated "5/23/08"					
	The above items, amounts, quantities, and related information are based on Callander Associates' judgment at this level					
	of document preparation and is offered only as reference data. Callander Associates has no control over construction quantities,					
	costs and related factors affecting costs, and advises the client that significant variation may occur between					
	this estimate of probable construction costs and actual construction prices.					

Preliminary Draft Estimate of Probable Project Costs

prepared for the
City of San Ramon and the Town of Danville

**Iron Horse Trail
 Arch**

prepared on: 5/23/08
 prepared by: CS
 checked by: MS

Item #	Description	Qty	Unit	Cost	Item Total	Subtotal
A	Project Start-up					
1.	Bonding and mobilization	Allow	3%	\$170,139.00	\$170,139.	
2.	Construction staking	Allow	LS	\$10,000.00	\$10,000.	
3.	Temporary fencing	1,300	LF	\$3.00	\$3,900.	
4.	Tree pruning/protection	Allow	LS	\$2,500.00	\$2,500.	
5.	Traffic control	Allow	LS	\$25,000.00	\$25,000.	
6.	Utility mapping	Allow	LS	\$5,000.00	\$5,000.	
						\$216,540.
B	Demolition					
1.	Clearing and grubbing	Allow	LS	\$2,500.00	\$2,500.	
2.	Tree removal	Allow	LS	\$2,500.00	\$2,500.	
3.	Utility adjustments	Allow	LS	\$6,000.00	\$6,000.	
4.	Asphalt path	Allow	LS	\$30,000.00	\$30,000.	
5.	Fencing	Allow	LS	\$300.00	\$300.	
						\$41,300.
C	Bridge Construction					
1.	Prefabricated bridge	155	LF	\$5,000.00	\$775,000.	
2.	Bridge ramps	560	LF	\$5,000.00	\$2,800,000.	
3.	Abutments	6	EA	\$250,000.00	\$1,500,000.	
4.	Approaches	240	LF	\$2,000.00	\$480,000.	
						\$5,555,000.
D	Site Construction					
1.	Directional/regulatory interpretative signage, fencing, striping	Allow	LS	\$15,000.00	\$15,000.	
2.	Asphalt paving	Allow	LS	\$20,000.00	\$20,000.	
3.	Concrete paving	Allow	LS	\$5,000.00	\$5,000.	
						\$40,000.
E	Lighting					
1.	Uplighting	Allow	LS	\$10,000.00	\$10,000.	
2.	Security lighting	Allow	LS	\$25,000.00	\$25,000.	
						\$35,000.
F	Construction Total					\$5,887,840.
G	Contingency	Allow	10%	\$588,784.00	\$588,784.	\$588,780.
H	City Administration					
1.	Design phase	Allow	15%	\$883,176.00	\$883,176.	
2.	Construction phase	Allow	10%	\$588,784.00	\$588,784.	
						\$1,471,960.
I	Professional Services					
1.	Boundary survey with utilities	Allow	LS	\$20,000.00	\$20,000.	
2.	Structural engineering	Allow	LS	\$460,000.00	\$460,000.	
3.	Electrical engineering	Allow	0.5%	\$32,383.10	\$32,383.	
4.	Geotechnical engineering	Allow	LS	\$20,000.00	\$20,000.	
5.	Site planning/landscape architecture	Allow	3%	\$194,298.60	\$194,299.	
6.	Construction management	Allow	4%	\$259,064.80	\$259,065.	
						\$985,750.
J	Permitting					
1.	Regulatory agency permit fees	Allow	2%	\$129,532.40	\$129,532.	
						\$129,530.
K	Total Project Cost					\$9,063,860.
L	Exclusions					
	utility relocation, inflation, all other costs					

Preliminary Draft Estimate of Probable Project Costs

prepared for the
City of San Ramon and the Town of Danville

**Iron Horse Trail
 Arch**

prepared on: 5/23/08
 prepared by: CS
 checked by: MS

Item #	Description	Qty	Unit	Cost	Item Total	Subtotal
	Based on drawing entitled "Potential Bridge Concepts", dated "5/23/08"					
	The above items, amounts, quantities, and related information are based on Callander Associates' judgment at this level					
	of document preparation and is offered only as reference data. Callander Associates has no control over construction quantities,					
	costs and related factors affecting costs, and advises the client that significant variation may occur between					
	this estimate of probable construction costs and actual construction prices.					



MEMORANDUM

Date: April 24, 2008

To: Mark Slichter, Callander Associates

From: Emily Johnson and Ellen Poling, Fehr & Peers

Subject: *Final Iron Horse Trail Corridor Concept Plan: Summary of Data Collection, Analysis, and Usage Forecasts*

WC07-2471

Fehr & Peers was charged with determining the existing use and forecasting the future use of the Iron Horse Trail at three proposed overcrossing locations. The forecasts will help the Project Team prioritize and plan the overcrossings to accommodate the expected level of use. The proposed locations are at Sycamore Valley Road in the Town of Danville, and Crow Canyon Road and Bollinger Canyon Road in the City of San Ramon. The study corridor and proposed overcrossing locations are shown in **Figure 1**. All figures are attached at the end of this memorandum.

This memorandum presents the results of Fehr & Peers' data collection, analysis, and usage forecasts for the corridor, and incorporates comments received from the project team on the Draft Memorandum presented in January and March 2008. The memorandum is divided into the following three sections:

1. Existing Trail Use & Vehicle Volumes
2. Future Use Projections
3. Preliminary Findings

1. EXISTING TRAIL USE & VEHICLE VOLUMES

Trail use

Fehr & Peers counted trail users at the three proposed overcrossing locations on a weekday (Tuesday, October 23, 2007) during the morning (8:00-9:00 AM), mid-day (2:00-3:00 PM or 3:00-4:00 PM), and evening (4:00-5:00 PM) peak hours. We also counted trail users on a weekend (Saturday, November 3, 2007) at the three proposed overcrossing locations and one additional location (El Capitan Drive in San Ramon) during the Saturday peak hour (10:00-11:00 AM). The peak hours were selected to capture peak use from local residents, school children, and employees. The trail is also used during the lunch hour (12:00-1:00 PM), but this hour was not counted. Weather on both days was clear and sunny, and no unusual activity was noted. It is likely that trail use would be higher during the spring or summer, but the project schedule did not allow for counts during this time.

The counts included direction of travel and differentiated between pedestrians, adult bicyclists, child bicyclists, runners, and other (skateboarders, rollerbladers, etc.) We supplemented the data collected with recent counts by the Town of Danville at El Capitan Drive and Greenbrook Drive during the morning and mid-day peak hours. The trail counts are summarized in Table 1 and the combined data (counts plus City data) is shown on **Figure 2**.

**TABLE 1
 EXISTING PEAK HOUR TRAIL USE: COUNT SUMMARY**

Location	User Type					Total
	Pedestrians-Adults	Bicyclists-Adult	Bicyclists-Children	Runners	Other	
8:00-9:00 AM						
Sycamore Valley	9	24	5	5	3	46
El Capitan ¹	-	-	-	-	-	-
Crow Canyon	13	18	1	2	0	34
Bollinger Canyon	42	12	0	3	0	57
Total	64	54	6	10	3	137
Mode split ²	47%	40%	4%	7%	2%	100%
2:00-3:00/3:00-4:00 PM						
Sycamore Valley	0	18	7	0	2	27
El Capitan ¹	-	-	-	-	-	-
Crow Canyon	4	12	2	4	0	22
Bollinger Canyon	13	16	10	1	0	40
Total	17	46	19	5	2	89
Mode split	19%	52%	21%	6%	2%	100%
4:00-5:00 PM						
Sycamore Valley	13	35	0	6	0	54
El Capitan ¹	-	-	-	-	-	-
Crow Canyon	4	34	0	7	0	45
Bollinger Canyon	10	25	0	3	0	38
Total	27	94	0	16	0	137
Mode split	20%	68%	0%	12%	0%	100%
10:00-11:00 AM Saturday						
Sycamore Valley	19	32	0	15	0	66
El Capitan	19	45	6	20	1	91
Crow Canyon	18	47	6	21	1	93
Bollinger Canyon	27	43	0	8	2	80
Total	83	167	12	64	4	330
Mode split	25%	51%	4%	19%	1%	100%

Notes:
 1. El Capitan was counted only on Saturday.
 2. Calculated as the sum of each user type divided by the total use for each period.
 Fehr & Peers, 2008.

The trail counts show that use at each of the locations was highest during the Saturday peak hour. During the morning and mid-day peak hours, use was highest at Bollinger Canyon Road. During the evening peak hour, use was highest at Sycamore Valley Road. During the Saturday peak hour, use was highest at Crow Canyon Road. In terms of user types, there were more pedestrians than other types in the morning peak hour (although there were almost as many cyclists), and more bicyclists than other user types in the mid-day, evening, and Saturday peak hours. It is important to note that these counts represent only those trail users who cross the study intersections; the counts do not include people on the trail in between the crossings.

Vehicle Volumes

In addition to the trail user counts, Fehr & Peers collected recent vehicle counts from the Town of Danville, City of San Ramon, and other sources. This data included weekday vehicle counts adjacent to each proposed overcrossing location during the morning and evening peak hours, and twenty-four hour weekday vehicle counts adjacent to each overcrossing location. Table 2 highlights the peak hour vehicle volumes crossing the trail. The total existing vehicle volumes are shown in **Figure 3**.

TABLE 2		
EXISTING PEAK HOUR VEHICLE VOLUMES CROSSING TRAIL		
Location	AM	PM
Sycamore Valley Road	2,363	2,409
Crow Canyon Road (west)	3,224	3,513
Crow Canyon Road (east)	3,000	3,255
Crow Canyon Road (average) ¹	3,112	3,384
Bollinger Canyon Road	2,796	3,550

Notes:
 1. Because there is not a vehicle intersection at Crow Canyon Road and the trail, volumes from two adjacent intersections were averaged.
 Fehr & Peers, 2008.

The vehicle volumes show that during the morning and evening peak hours, about the same volume of traffic crosses the trail on Crow Canyon Road and Bollinger Canyon Road, while fewer vehicles cross the trail on Sycamore Valley Road.

Fehr & Peers determined the key origins and destinations for trail users, based on field observations and map review. These origins and destinations are shown on **Figure 4** and listed below (uses with particularly direct trail access are starred below).

Residential

Adjacent Residents in San Ramon and Danville

- *Baldwin Elementary School and park, Danville
- Charlotte Wood Middle School, Danville
- *Greenbrook Elementary School and park, Danville

Local Schools

San Ramon Valley High School, Danville

- *Iron Horse Middle School, San Ramon

*Montevideo Elementary School and park,
San Ramon
*California High School and aquatic center,
San Ramon

Parks

Osage Station Park, Danville
*Central Park, San Ramon

Employers

Crow Canyon Commons and adjacent
offices, San Ramon
*Bishop Ranch offices, San Ramon
Chevron (at Bishop Ranch), San Ramon
AT&T (at Bishop Ranch), San Ramon

Retail

*Downtown Danville
Village Shopping Center, Danville
Shops at Bishop Ranch, San Ramon
Marketplace Shopping Center, San Ramon

Other

*Sycamore Valley Park and Ride, Danville
San Ramon Regional Medical Center, San
Ramon
*San Ramon Transit Center (at Bishop
Ranch)
San Ramon Community Center
San Ramon Public Library

Safety and Other Observations

Observations of typical use patterns, safety issues, and other characteristics of the trail were collected at each proposed crossing location. These are summarized for each location below and shown in **Figure 5**.

Sycamore Valley Road

Typical weekday use at the Sycamore Valley Road crossing in the morning was groups of cyclists and single pedestrians and joggers. In the mid-day, the typical user was a lone cyclist. In the evening, the typical user was a male recreational cyclist. Overall, the trail was not crowded and use seemed low. A few students were observed using the trail in the morning, but none were observed in the mid-day period.

Several pedestrians and runners were observed approaching the crossing, particularly from the north, and turning back. It was assumed that these were recreational users who used the intersection as a convenient turn-around point for their workout. The long signal cycle (observed to be about 80 seconds) was also assumed to be a deterrent to continuing along the trail. A countdown signal could be helpful for pedestrians approaching the crosswalk.

We observed that trail users crossing at Sycamore Valley Road can get cut off in the crosswalk by northbound right-turning vehicles. This is particularly an issue for persons crossing northbound, as vehicle drivers tend to focus on traffic to their left and are less likely to look to their right for people in the crosswalk.

Use on Saturday was substantially higher than on the weekday, and trail users were relatively evenly split between pedestrians and cyclists. Several groups of people were observed. Some cyclists had child carriers attached to their bikes, and some people were observed running with dogs.

Crow Canyon Road

Weekday use at the Crow Canyon crossing was relatively low overall, though the evening period had higher use than the morning or mid-day. A few students were observed using the trail in the morning, but none were observed in the mid-day period. Crow Canyon Road is signed as a Class

III bike route, but few cyclists were observed on the roadway. A few cyclists were observed riding from the east and accessing the trail to head south.

As at Sycamore Valley Road, several trail users (particularly pedestrians) were observed to approach the intersection but turn around before crossing. The long signal cycle (observed to be 90 seconds or more) was assumed to be a deterrent to continuing along the trail. The countdown signal, which provides 24 seconds to cross, was helpful to trail users approaching the intersection.

Many users were observed jay-walking, most likely due to the long cycle length, the median, and the lack of north-south vehicle traffic. The long wait and resulting jay-walking creates frustration for trail users as well as drivers along Crow Canyon Road. As an example, a cyclist waited for a gap in traffic, crossed to the median, pushed the push-button there, waited for a second gap, and crossed to the far side. After he finished crossing, the walk phase began and drivers had to wait for no apparent reason.

Bollinger Canyon Road

Typical weekday use at the Bollinger Canyon Road crossing included single users and small groups of pedestrians and cyclists. Several users walked from the trail to Central Park and the unpaved trail adjacent to it. Several people came to or from the east on the sidewalk. Overall, this portion of the trail had moderate use, with higher use in the morning.

On Saturday, Bollinger Canyon Road seemed to have more vehicle traffic than Sycamore Valley Road or Crow Canyon Road. Trail use was slightly lower than points further north on the trail.

Few school-aged children were observed on the trail in the morning and mid-day. However, a large group of runners from the California High School cross-country team ran along the trail in the afternoon, crossing Bollinger Canyon northbound at about 3:45 PM and then returning southbound at about 4:00 PM. There were about 25 runners in total, plus two coaches on bicycles. The runners clustered in groups of about 15 while waiting for the signal.

As at Crow Canyon Road, several instances of jay-walking were observed. The long signal cycle (observed to be about 80 seconds) was clearly frustrating for many people, who became impatient and pushed the push-button repeatedly. Bicyclists were particularly likely to cross against the signal, because they were able to cross quickly. Others, including runners and cyclists, crossed against the signal to the median and waited for gaps in traffic to complete their crossing. However, the median is not wide enough to protect a bicyclist from vehicle traffic.

Another safety issue that was observed is that eastbound vehicles on Bollinger Canyon Road backed up in the evening, blocking the crosswalk. This was observed twice in five minutes around 5:30 PM on a weeknight. Trail users were forced to walk or bike through traffic to cross, and some cyclists took advantage of the stopped traffic to cross against the signal. The sidewalk on the north side of the road is narrow, making it difficult to turn onto the crossing from the trail, and vice versa.

Summary of Observations

Overall, few conflicts were observed between trail users; rather, the key issues are conflicts between trail users and vehicles, and the long signal cycles at the crossings. Both trail users that

currently jay-walk across the intersection and those that turn around to avoid the crossing would benefit from an overcrossing.

Collision Data

Data provided by the City of San Ramon and the California Highway Patrol (SWITRS data) shows that between 2002 and 2007, there were five bicycle- or pedestrian-related collisions at intersections on the Iron Horse Trail in the study area (between Sycamore Valley Road and Bollinger Canyon Road). All five of these involved an automobile and a bicycle. Three occurred at or near the intersection of the trail and Crow Canyon Road, while two occurred at the intersection of the trail and Greenbrook Drive. Of the three collisions at Crow Canyon Road, one involved a bicyclist under the influence of alcohol colliding with a stopped vehicle; and two involved a vehicle not obeying the traffic signal and pulling into the crosswalk, hitting the bicyclist. The police reports for the two collisions at Greenbrook Drive cite violation of the automobile's right of way by the bicyclist as the primary collision factor.

2. FUTURE USE PROJECTIONS

Future use of the trail is affected by several factors. These include employment growth, residential growth, and other development along the corridor, as well as changes to the trail itself, such as the provision of overcrossings, that make it more attractive. Fehr & Peers developed projections of future use on the trail based on these factors, each of which is outlined below.

Planned Development/Growth

There are several developments planned along the corridor. These include the Rose Garden (apartments, office, and retail), Charlotte Wood area housing, Crow Canyon area condominiums, and the San Ramon City Center (condominiums, office, retail, hotel, cinema, and library). These are highlighted in **Figure 6**. Several new connections to the trail are planned as part of these developments. The Rose Garden project includes two trail connections, one to the commercial portion of the project and a second to the residential units through a private gate. The residential development near Charlotte Wood School will include a connection between the trail and Osage Park, and new connections are planned between the trail and the City Center project, both at Bishop Drive (at the northern boundary of the site) and at Bollinger Canyon Road. A proposed new connection between the trail and Central Park is also planned as part of the City Center project.

Based on the planned development, Fehr & Peers estimated the number of new employees and residents along the corridor. These calculations and the assumptions used are summarized in Table 3. In total, we estimate that there will be about 3,700 new employees and 1,000 new residents along the corridor with these projects. The majority of the new jobs and housing is planned to occur as part of the City Center project adjacent to Bollinger Canyon Road.

TABLE 3			
DEVELOPMENT PLANNED ALONG THE STUDY CORRIDOR			
Development	Size (sq ft or DU)	New Employees	New Residents
Rose Garden			
Office ¹	29,440	118	
Retail/Restaurant ²	56,640	113	
Apartments ³	55		93
City Center			
Retail ²	663,339	1,327	
Hotel ⁴	169 rooms	152	
Cinema ⁵	6 screens	31	
Library ⁶	35,340	35	
Condominiums ³	488		830
City Center/Bishop Ranch			
Office Expansion ¹	487,117	1,949	
Other			
Charlotte Wood Homes ⁷	9		24
Crow Canyon Condos ³	35		59
Total		3,725	1,006
Notes:			
1. Assumed 250 sq ft/employee for offices.			
2. Assumed 500 sq ft/employee for retail & restaurants.			
3. Assumed 1.7 persons per unit for apartments and condominiums			
4. Assumed 0.9 employees per hotel room, based on the ITE <i>Trip Generation Handbook</i> , page 541.			
5. Assumed about 5.2 employees per screen, based on ITE <i>Trip Generation Handbook</i> rates for multiplex cinema.			
6. Assumed 1000 sq ft/employee for library.			
7. Assumed 2.63 persons per house, based on 2000 Census average household size for San Ramon.			
Sources: <i>San Ramon City Center Environmental Impact Report</i> , Town of Danville, City of San Ramon. Fehr & Peers, 2008.			

To determine the effect of this development on use of the trail, we used the following assumptions:

- 77 percent of the new residents living along the trail will work, and three percent of those who work will use the trail on their way to work and back. According to the 2000 Census, 77 percent of San Ramon's population is of working age, and 1.2 percent of San Ramon residents currently walk or bike to work. We doubled the city-wide walk and bike mode share for the new residents due to their proximity to the trail, and to account for residents who would walk or bike to the San Ramon Transit Center or the Sycamore Park and Ride, which provide transit connections to employment centers throughout the Bay Area.

The percentage is not higher because many work locations may not be accessible by the trail or transit.

- 19 percent of the new residents will be students (ages 5-18), and 20 percent of the new students living along the trail will use it to get to school and back. The proportion of students within the new households is based on 2000 Census data for San Ramon. According to the 2003 Contra Costa Countywide Bicycle and Pedestrian Plan, in most communities, between 5 and 20 percent of students bicycle to school. We assumed the high end of this range due to the proximity of schools and new residences to the trail, and also to include students who walk to school.
- Three percent of new employees working along the trail will use trail to get to work and back. Based on 2000 Census data, about 1.3 percent of employees working in San Ramon walk or bike to work. However, between 2.5 and 2.8 percent of employees at Bishop Ranch currently walk or bike to work, based on a 2006 survey. We assumed a percentage consistent with commute patterns for Bishop Ranch employees, because the new work locations are all directly adjacent to the trail.
- 5 percent of new residents will use the trail on Saturday during the peak hour. This estimate is based on professional judgment.
- We distributed these new trail trips among the three proposed overcrossing locations to account for the different concentrations of development at each location:
 - Because most of the new employment is concentrated near Bollinger Canyon Road, we assumed that 100 percent of the new employees' trips would cross that roadway. Because we don't know where the new employees will be coming from, we assumed that 50 percent would also cross Crow Canyon Road, and 10 percent would also cross Sycamore Valley Road. This roughly reflects each intersection's proportion of the new jobs and proximity to new job locations.
 - Because the residential development is spread along the corridor, we assumed that 100 percent of the new residents' Saturday trips and workday trips would cross each of the three proposed overcrossing locations.

Because the residential development and schools are spread along the corridor, we assumed that 100 percent of the new students' trips would cross each of the three proposed overcrossing locations. Table 4 summarizes the projected effects of planned development on future trail use, both for each of the four peak hours studied, and at each of the three proposed overcrossing locations. Overall, we project increases at each location of about 70 to 170 users in the morning peak hour; 40 users in the mid-day peak hour, 35 to 135 users in the evening peak hour, and 50 users in the Saturday peak hour. The largest increases are projected to occur at Bollinger Canyon Road.

**TABLE 4
 PROJECTED FUTURE TRAIL USE FROM PLANNED DEVELOPMENT**

User Type	Total	Percent using Trail	Peak Hour			
			Morning	Mid-Day	Evening	Saturday
Residents ¹	1,006	5%				50
Working Residents ²	775	3%	23		23	
Students ³	190	20%	38	38		
Employees ⁴	3,725	3%	112		112	
Total			173	38	135	50
Crossing Location	Distribution of Use		Morning	Mid-Day	Evening	Saturday
Sycamore	10% of employees; 100% of others		72	38	34	50
Crow Canyon	50% of employees; 100% of others		117	38	79	50
Bollinger Canyon	100% of employees; 100% of others		173	38	135	50
Notes:						
1. Reflects residents of planned housing along the trail.						
2. Reflects proportion of new residents who would work.						
3. Reflects proportion of new residents who would be students.						
4. Reflects employees of new office, retail, and other development along the trail.						
Fehr & Peers, 2008.						

Effects of Proposed Overcrossings

In addition to the development planned along the trail, we considered the effect of the proposed overcrossings on trail use. As described above, the major intersections are often treated by trail users as “turn-around points,” either to avoid crossing vehicle traffic or to avoid waiting for the walk signal. Based on observations during a weekday morning, up to about 25 percent of trail users approaching the proposed overcrossing locations turned around without crossing. These were assumed to be recreational users, but the “barrier effect” of the existing at-grade intersections also likely reduces trail use by those who might otherwise use the trail to get to school, work, or other destinations.

Constructing an elevated overcrossing at any of the three proposed locations would reduce this “barrier effect” and thereby increase recreational use of the trail, as well as transportation use by students, employees, and residents. To account for this effect, we assumed that trail use by the estimated future recreational users at each crossing would increase by 25 percent if an overcrossing were provided. Based on field observations, recreational use accounts for about 65 percent of morning peak hour users; 75 percent of mid-day and evening peak hour users; and

100 percent of Saturday peak hour users. We applied the 25 percent “barrier effect” increase to these proportions of projected future users. The combined effects of planned development and the construction of the overcrossings are shown in Table 5.

TABLE 5					
PROJECTED FUTURE TRAIL USE:					
COMBINED EFFECTS OF DEVELOPMENT AND OVERCROSSINGS					
Location	Use	Peak Hour			
		Morning	Mid-Day	Evening	Saturday
Sycamore	Existing	46	27	54	66
	Future from Development	72	38	34	50
	Existing + Development	118	65	88	116
	Recreational %	65%	75%	75%	100%
	Future recreational users	77	49	66	116
	Barrier Effect¹	<u>19</u>	<u>12</u>	<u>17</u>	<u>29</u>
	Total Future	138	77	105	145
Crow Canyon	Existing	34	22	45	93
	Future from Development	117	38	79	50
	Existing + Development	151	60	124	143
	Recreational %	65%	75%	75%	100%
	Future recreational users	98	45	93	143
	Barrier Effect¹	<u>25</u>	<u>11</u>	<u>23</u>	<u>36</u>
	Total Future	176	71	147	179
Bollinger Canyon	Existing	57	40	38	80
	Future from Development	173	38	135	50
	Existing + Development	230	78	173	130
	Recreational %	65%	75%	75%	100%
	Future recreational users	149	58	130	130
	Barrier Effect¹	<u>37</u>	<u>15</u>	<u>32</u>	<u>33</u>
	Total Future	267	93	205	163
Notes:					
1. Represents an increase in use of 25 percent by recreational users.					
Fehr & Peers, 2008.					

Other Factors

In addition to future development and the proposed overcrossings, other factors could affect future trail use. These include changing values and lifestyles, such as increased awareness of healthy transportation or interest in recreation, and policies or programs, such as Safe Routes to School initiatives. These effects were not quantified, but could increase trail use above the projections presented here.

3. PRELIMINARY FINDINGS

Projected Future Trail Volumes

Based on the projections discussed above, we would expect between 135 to 270 trail users during the morning peak hour, 70 to 90 trail users during the mid-day peak hour, 100 to 200 trail users during the evening peak hour, and 150 to 180 trail users during the Saturday peak hour at the proposed overcrossing locations. The highest weekday use is projected to occur at Bollinger Canyon Road, while the highest Saturday use is projected to occur at Crow Canyon Road. The overall highest use is projected to occur during the morning peak hour at Bollinger Canyon Road.

The projected total and percentage growth at each proposed overcrossing location is summarized in Table 6. The largest growth in trail use is expected to occur at Bollinger Canyon Road, with between 100 and 370 percent growth, representing between 50 and 210 new users per peak hour. On average, growth at Bollinger Canyon Road is expected to be above 250 percent in the peak hours. Growth at Crow Canyon Road is expected to be similar, with between 90 and 420 percent growth, representing between 50 and 140 new users per peak hour. On average, growth at Crow Canyon Road is expected to be about 240 percent in the peak hours. Growth at Sycamore Valley Road is expected to be slightly less, with between 90 and 200 percent growth, representing between 50 and 100 new users per peak hour. On average, growth at Sycamore Valley Road is expected to be about 150 percent in the peak hours.

The projected future volumes at the proposed overcrossing locations are shown in **Figure 7**.

TABLE 6					
PROJECTED FUTURE TRAIL USE AND PERCENTAGE GROWTH					
	Peak Hour				Average
	AM	MD	PM	Sat	
<i>Sycamore Valley Road</i>					
Existing Use	46	27	54	66	48
Future Use	138	77	105	145	116
Growth	92	50	51	79	68
Percentage Growth	199%	186%	94%	120%	150%
<i>Crow Canyon Road</i>					
Existing Use	34	22	45	93	49
Future Use	176	71	147	179	143
Growth	142	49	102	86	95
Percentage Growth	416%	224%	228%	93%	240%
<i>Bollinger Canyon Road</i>					
Existing Use	57	40	38	80	54
Future Use	267	93	205	163	182
Growth	210	53	167	83	128
Percentage Growth	369%	131%	441%	104%	261%
Fehr & Peers, 2008.					

Projected Future Vehicle Volumes

As a comparison to the projected future trail use, we analyzed future vehicle volumes at the three proposed overcrossing locations, using data from recent traffic studies. This data is shown on **Figure 8** and summarized in Table 7. **Figure 9** compares the projected growth in trail use to projected increases in vehicle traffic at the three proposed overcrossing locations.

TABLE 7 PROJECTED VEHICLE TRAFFIC GROWTH CROSSING TRAIL						
Location	Existing Volumes		Future Projected Volumes		Percent Growth	
	AM	PM	AM	PM	AM	PM
Sycamore ¹	2,363	2,409	2,901	3,085	23%	28%
Crow Canyon ²	3,112	3,384	3,786	4,281	22%	26%
Bollinger Canyon ²	2,796	3,550	3,747	5,294	34%	49%

Notes:
 1. Data from *Elworthy Ranch Environmental Impact Report*: Existing and 2020 volumes with project.
 2. Data from *San Ramon City Center Environmental Impact Report*: Existing and 2020 volumes with project.
 Fehr & Peers, 2008.

As shown in Table 7, currently, Crow Canyon Road has the most vehicle traffic crossing the trail in the morning peak hour, and Bollinger Canyon Road has the most vehicle traffic crossing the trail in the evening peak hour. In the future, Crow Canyon Road and Bollinger Canyon Road are expected to have about the same amount of vehicle traffic crossing the trail in the morning (about 3,700 vehicles per hour), and Bollinger Canyon Road is expected to have the highest amount of traffic crossing the trail in the evening, with about 5,300 vehicles per hour.

Future Operations

Overcrossings

Future operations of the proposed overcrossings will depend on the width and design of the overcrossings. We understand that the design team has assumed a total width of 14 feet for the overcrossing structure, and a total length of approximately 1,000 feet. Fehr & Peers analyzed the operations of such a structure using the Federal Highway Administration’s (FHWA’s) recent Shared-Use Path Level of Service Calculator. The calculator estimates the operations of a shared-use path based on total one-way user volume, proportions of various user types, path width, and the presence of a centerline¹. The calculator was developed based on bicyclists’ perceptions of comfort and freedom on various trail types, and has the following characteristics:

- It prioritizes bicyclists’ ability to maintain an optimum speed and maneuver freely.
- It is designed for use on a minimum 0.25-mile (1,320-foot) long trail segment.
- It assumes a peak hour factor of 0.85, meaning that it bases the analysis on a peak 15-minute period with 15 percent higher use than if the hourly volume were evenly split across the whole hour.
- It assumes a bicyclist speed of 12.8 miles per hour.
- The score (level of service) is based on the trail’s peak use, and thus represents a worst-case scenario.

¹ See <http://www.tfhr.gov/safety/pedbike/pubs/05138/>

Although the tool is designed for bicycle-pedestrian paths rather than bridges, it can provide information about the relative performance of the bridge at various widths, given the level of use and mode split expected on the bridge. We assumed that the overcrossings' effective travelway width would be between 10 and 14 feet, due to railings and the need for clearance from the edge. Widths of less than 10 feet are not recommended. Generally, an overcrossing should be at least as wide as the trail, which in this case is typically about 10 feet.

We tested several widths to determine which would operate acceptably, using the highest projected volume and user mix for each overcrossing location. The volumes and user mix tested are outlined in Table 8, and the results of the analysis are shown in Table 9.

TABLE 8			
PEAK HOUR VOLUME AND USER MIX ASSUMPTIONS			
	Sycamore Valley Road	Crow Canyon Road	Bollinger Canyon Road
Highest Peak Hour	Saturday	Weekday PM	Weekday AM
One-way volume	74	94	135
Mode Split (based on observed corridor mix during highest peak hour):			
Adult bicyclists	51%	68%	40%
Pedestrians	25%	20%	47%
Runners	19%	12%	7%
Child Bicyclists	4%	0%	4%
Other	1%	0%	2%
Fehr & Peers, 2008.			

Based on this analysis, both the Sycamore Valley Road and Crow Canyon Road overcrossings are projected to operate acceptably at effective widths of 10 feet or greater. Effective widths of 11 feet would provide significant room to absorb additional users. The Bollinger Canyon Road overcrossing is projected to operate acceptably at effective widths of 12 feet or greater. However, an effective width greater than 14 feet would be needed to provide significant room to absorb additional users. An effective width of 11 feet or less at the Bollinger Canyon Road overcrossing would likely cause peak period travel speeds to be reduced.

It should be noted that bicyclists on the overcrossings will ride more slowly than they would on a path, at least on the "uphill" ramp. Therefore, the relative speed differences between bridge users, and thus the impact of pedestrians on bicyclists' level of service, may be less dramatic than the tool suggests. As a comparison, the Ygnacio Valley Road overcrossing is approximately ten feet wide and generally operates acceptably, based on observations and discussions with East Bay Regional Park District staff. However, it was noted that the ten-foot width feels tight when there are bicyclists traveling in both directions and a third bicyclist passing in between.

TABLE 9			
SHARED-USE PATH LEVEL OF SERVICE RESULTS			
Effective Width	Centerline	Level of Service¹	LOS Grade¹
<i>Sycamore Valley Road</i>			
14	No	4.07	A
12	No	3.88	B
11	No	3.76	B
10	No	3.36	C
<i>Crow Canyon Road</i>			
14	No	4.06	A
12	No	3.87	B
11	No	3.75	B
10	No	3.34	C
<i>Bollinger Canyon Road</i>			
14	No	3.25	C
12	No	3.06	C
11	No	2.94	D
10	No	2.05	E
Notes:			
¹ According to the tool user guide, LOS A-C can be considered acceptable and D-F can be considered "degraded." A (4.0 or greater) = Excellent; optimum conditions for individual bicyclists; retains ample space to absorb more users of all modes. B (3.5 to 4.0) = Good bicycling conditions; retains significant room to absorb more users. C (3.0 to 3.5) = Fair; Trail has at least minimum width to meet current demand and to provide basic service to bicyclists. More pedestrians, runners, or other slow-moving users will begin to diminish LOS for bicyclists. D (2.5 to 3.0) = Poor; nearing functional capacity. Peak period speeds likely to be reduced by levels of crowding. E (2.0 to 2.5) = Very poor; trail has reached functional capacity; peak period travel speeds are likely to be reduced. F (less than 2.0) = Significant user conflicts should be expected. Source: <i>Shared-Use Path Draft Level of Service Calculator</i> , provided by FHWA staff; Fehr & Peers 2007.			

Pedestrian and Bicycle Access to Adjacent Land Uses

Currently, trail users have relatively easy access to land uses adjacent to the trail, such as the residential areas near Sycamore Valley Road, the businesses along Crow Canyon Road, and the San Ramon Central Park, Marketplace shopping center, and offices adjacent to Bollinger Canyon Road. It will be important to preserve connections between the trail and adjacent uses if the proposed overcrossings are constructed. Additionally, connections between the trail and planned new development should be incorporated into the overcrossing planning.

For example, many trail users were observed traveling between the trail and the San Ramon Central Park. However, the path just north of Bollinger Canyon Road that connects the park to the trail will likely be inaccessible by people on the overcrossing. While there are additional

connections between the trail and park further north, they require users to travel further out of their way. Preserving parallel at-grade crossings and providing stairs or a more direct ramp from the overcrossing should be considered to facilitate access to the park and other adjacent uses. Similarly, access between the overcrossings and planned development, such as the San Ramon City Center project, should be made as convenient as possible.

Vehicle Operations

Overview

Vehicle operations are typically classified by a level of service grading system that qualitatively characterizes traffic conditions associated with varying levels of vehicle traffic, ranging from level of service (LOS) A (indicating free-flow traffic conditions with little or no delay experienced by motorists) to LOS F (indicating congested conditions where traffic flows exceed design capacity and result in long queues and delays). LOS A to C are generally considered satisfactory service levels, while the influence of congestion becomes more noticeable (though still considered acceptable) at LOS D. LOS E and LOS F are generally considered to be unacceptable, though some jurisdictions consider LOS E to be acceptable in certain areas (like a downtown central business district) in recognition of the positive effect of traffic congestion in promoting the use of transit, bicycling, and walking.

Based on recent studies, the existing level of service for vehicles at intersections adjacent to the three proposed overcrossing locations ranges from LOS A to LOS C in the morning peak hour, and from LOS A to LOS D in the evening peak hour. Future levels of service at these intersections are estimated to be similar, ranging from LOS A to LOS C in the morning peak hour and from LOS B to LOS D in the evening peak hour. These levels of service include planned roadway improvements, including widening Bollinger Canyon Road at Alcosta Boulevard to three through lanes in each direction and widening Bollinger Canyon Road at Bishop Ranch East to four through lanes in both directions with dual left turn lanes.² The existing and projected future LOS for key intersections in the study area is shown in Table 10.

The Bollinger Canyon Road/Alcosta Boulevard intersection is expected to operate the most poorly in the future, with LOS D in the evening peak hour. However, it should be noted that these analyses used the CCTALOS methodology, which measures volume versus capacity, and does not account for signal timing or pedestrian volumes. Based on recent observations of peak hour congestion, service levels can be worse than indicated by the planning-level CCTALOS methodology.

Effects of Removing At-Grade Trail Crossings

Currently, the at-grade crossings affect vehicle operations by stopping traffic whenever the pedestrian walk signal is activated (a pedestrian signal “call”). Based on the trail counts, there are currently between 30 and 60 trail users crossing the three intersections during the morning and evening peak hours. Since some of these users are in groups, this results in a pedestrian signal “call” about once every two minutes. This is unlikely to significantly affect vehicle operations along any of the three roadways. However, the projected growth in trail use and vehicle traffic will likely deteriorate operations for both vehicles and trail users.

² Note that this geometry, which was assumed in the City Center EIR, is different than the City’s most recent design plans for Bollinger Canyon Road at the Iron Horse Trail, as described later in this report.

The effects of removing the at-grade crossings on vehicle traffic depend on the configuration of the crossing. At Sycamore Valley Road and Bollinger Canyon Road, the crossings are located at roadway intersections. If the at-grade crossings are removed, trail users could cross the roadway at any time, but vehicles on the main roadway would continue to stop for cross-traffic. Existing peak hour traffic volumes on Bishop Ranch East at Bollinger Canyon Road and Camino Ramon at Sycamore Valley Road are relatively low, but future peak hour volumes on these cross-streets are expected to be more substantial, particularly with the proposed addition of a southbound leg on Bishop Ranch East and evening traffic from the City Center project, as well as northbound traffic diverted from the freeway onto Camino Ramon.

TABLE 10				
EXISTING AND FUTURE VEHICLE LEVEL OF SERVICE (WITHOUT OVERCROSSINGS)				
Intersection	Existing		Future	
	AM	PM	AM	PM
Sycamore Valley Road/Camino Ramon	A	A	B	C
Crow Canyon Rd/Camino Ramon	A	C	B	C
Crow Canyon Rd/Alcosta Blvd	A	B	A	C
Bollinger Canyon Rd/Camino Ramon	A	C	B	B
Bollinger Canyon Rd/Bishop Ranch 1E	A	A	A	C
Bollinger Canyon Rd/Market Place	A	A	A	B
Bollinger Canyon Rd/Alcosta Blvd	C	D	C	D
Sources: <i>San Ramon City Center Environmental Impact Report, Appendix I: Traffic Operations Evaluation, July, 2007</i> (Existing No Project and 2020 Plus Project results); <i>Elworthy Ranch Environmental Impact Report, Appendix D, November 2007</i> (Existing No Project and 2020 Plus Project results). Note that the Level of Service analysis was done using the CCTALOS methodology. Fehr & Peers, 2008.				

The benefits of removing the at-grade crossings could include improved coordination of signals along the roadways, allocation of additional green signal time to heavy vehicle movements, and reduction of vehicle back-ups such as those observed on eastbound Bollinger Canyon Road in the evening.

The existing trail crossing at Crow Canyon Road is a mid-block crossing with no intersecting vehicle traffic. Therefore, if the at-grade crossing were removed, trail users could cross the roadway at any time, and the traffic signal on Crow Canyon Road could be removed. In this case, removal of the at-grade crossing is likely to allow improved coordination of signals along the roadway, allocation of additional green signal time to heavy vehicle movements, and reduction of vehicle back-ups. The overall benefit to vehicle traffic may be small because the existing number of trail crossings is relatively low, but the benefit would be greater than at the other two locations.

At all locations, if the at-grade crossings were preserved, a high proportion of trail users would use the overcrossings rather than wait for the pedestrian signal. Trail users accessing uses directly adjacent to the intersection (such as Central Park or parts of the City Center project adjacent to Bollinger Canyon Road) may prefer the at-grade crossing, and continue to use it. The effect on traffic flow along Bollinger Canyon Road if a few users continue to use the at-grade crossing would be negligible, however.

Traffic Operations Analysis Results

Fehr & Peers tested the effects of removing the at-grade trail crossing on Bollinger Canyon Road on vehicle operations. This operations analysis was done using the Synchro software, which implements the Transportation Research Board's 2000 Highway Capacity Manual (HCM) method. HCM-based operations analysis uses traffic volumes, lane geometry, signal timing, and pedestrian activity to estimate the average delay (measured in seconds per vehicle) experienced by motorists traveling through an intersection. The HCM method was used because it accounts for pedestrian volumes and is considered a state of the practice tool. Synchro files developed by Kimley-Horn for the City Center project were provided and used for the baseline scenario, with minor adjustments described below, in order to be consistent with previous analyses of the intersection. The Synchro output is provided in Appendix C.

The following two scenarios were tested:

1. Future (2020) PM Baseline. This scenario assumes a widened Bollinger Canyon Road and the construction of a southbound leg of the intersection to serve the City Center project. The intersection geometry was based on plans provided in March, 2008 by Kimley-Horn staff. These plans include a left turn lane, three through lanes, and a shared through-right turn lane on eastbound Bollinger Canyon Road; a left turn lane, four through lanes, and a right turn lane on westbound Bollinger Canyon Road; a left turn lane and a shared through-right turn lane on northbound Bishop Ranch East; and two left turn lanes and a shared through-right turn lane on southbound Bishop Ranch East. Future vehicle volumes were based on the 2020 With Project Volumes presented in Exhibit 4.12-14a of the City Center Draft Subsequent EIR (DMJM Harris|AECOM, July 2007), with adjustments to add minimal northbound and southbound through traffic on Bishop Ranch East. The existing crosswalk on the northbound leg of the intersection was assumed to remain, while the existing crosswalk on the westbound leg of the intersection was removed, based on information from City staff. In addition, crosswalks on the eastbound and southbound legs were added, based on information provided by City staff. The projected PM peak hour trail crossing volume (shown in Table 5 of this report) was assumed for the crosswalk on the eastbound leg of the intersection. The intersection's signal timing was based on analyses conducted by Kimley-Horn for the City Center project (as provided by Kimley-Horn staff) and optimized to accommodate the future pedestrian and vehicle volumes at the intersection.
2. Future (2020) PM—With Overcrossing. This scenario assumes the same geometry and vehicle volumes as the Baseline scenario, but removes the crosswalk on the eastbound leg of the intersection, and assumes that pedestrians would use the overcrossing instead. The intersection's signal timing was re-optimized to accommodate the vehicle volumes at the intersection.

In the Baseline scenario, 38 seconds is required to provide enough time for northbound and southbound pedestrians to cross the widened Bollinger Canyon Road (5 seconds of “Walk” and 33 seconds of “Flashing Don’t Walk”). The “Flashing Don’t Walk” time is based on a curb to curb width of 116 feet (based on plans provided by Kimley-Horn) and a walking speed of 3.5 feet per second, which is consistent with best practices. This extends the green signal time for the parallel northbound and southbound approaches, which have relatively low vehicle volumes compared to Bollinger Canyon Road, and shortens the effective green time available for Bollinger Canyon Road. The overall level of service for the intersection is D, with an average delay of 52 seconds per vehicle. Vehicle queues for the eastbound through movement extend approximately 850 feet.

In the With Overcrossing scenario, northbound and southbound pedestrians are assumed to use the overcrossing. Therefore, the green time needed for pedestrians to cross Bollinger Canyon Road can be reallocated to serving the heavy vehicle volumes on Bollinger Canyon Road. The overall level of service for the intersection is C, with an average delay of 20 seconds per vehicle. Vehicle queues for the eastbound through movement extend about 130 feet, which is well within the available storage length between the Bishop Ranch East intersection and the upstream intersection at Camino Ramon. This is a reduction of 32 seconds of delay per vehicle, on average, and a decrease in the eastbound queue length of about 720 feet. While the effects of providing overcrossings at other locations would vary, in general drivers would experience less delay and shorter back-ups, particularly on the major street when the crossing is wide and minor-street volumes are relatively low.

Summary

A summary of the issues and expected benefits of the proposed overcrossings is presented below for each of the three locations. Conditions vary between the three proposed overcrossing locations, but trail users at each location would benefit from an overcrossing.

Sycamore Valley Road

The Sycamore Valley Road trail crossing currently has moderate use, similar to that at Crow Canyon Road but less than that at Bollinger Canyon Road. Vehicle volumes crossing the trail are lower at Sycamore Valley Road than at the other locations. Trail users were observed turning around before the crossing, likely to avoid the long signal cycle and multi-lane crossing. There are potential safety issues associated with northbound right-turning vehicles cutting off people in the crosswalk. With the planned Rose Garden development and the proximity of the Park & Ride lot, an overcrossing at this location has the potential to serve local residents, workers, and shoppers, as well as commuters and recreational users along the corridor. An overcrossing would also increase safety and convenience for trail users. It would improve traffic operations due to fewer pedestrian calls at the traffic signal, although to a lesser extent than would be seen at the Bollinger Canyon Road location.

Crow Canyon Road

The trail crossing at Crow Canyon Road is the only mid-block crossing of the three studied. Its current trail use is similar to that at Sycamore Valley Road but less than that at Bollinger Canyon Road. Crow Canyon Road currently has the highest vehicle volume crossing the trail in the morning peak hour, and has similar volumes to Bollinger Canyon Road in the evening peak hour. More bicycle-vehicle collisions have occurred at the Crow Canyon Road crossing over the last six years than at the other locations, based on available data. The long signal cycle and lack of cross-traffic results in many trail users jay-walking. Several users were observed turning around

before the crossing to avoid waiting for the signal. This location serves as a mid-point between the residential areas to the north and the office parks to the south. An overcrossing at this location would serve both nearby residents and employees, improve safety and convenience for trail users, and improve traffic operations along the corridor by removing a trail crossing (and traffic control point) from the roadway.

Bollinger Canyon Road

The Bollinger Canyon Road crossing currently has the highest trail use of the three crossings studied, as well as the highest vehicle volumes crossing the trail in the evening. Trail users here face long signal cycles and a multi-lane crossing, similar to the other crossings. Many trail users jay-walk. In addition, there are safety and vehicle operations issues in the evening, when eastbound vehicles back up, blocking the crosswalk. The largest increases in development, vehicle traffic, and trail use are expected at this location, due in large part to the San Ramon City Center project. Bollinger Canyon Road is planned to be widened to accommodate expected traffic associated with the City Center. The planned increase in residents, employees, shoppers, and other activity around Bollinger Canyon Road, as well as existing destinations such as Central Park, the Marketplace, and Bishop Ranch, provide many potential users for an overcrossing. An overcrossing at this location would improve safety and convenience for trail users, and improve traffic operations along the corridor.

Figures:

- 1: Study Corridor and Proposed Overcrossing Locations
- 2: Trail Count Data
- 3: Existing Vehicle Volumes
- 4: Existing Origins and Destinations
- 5: Summary of Observations and Safety Issues
- 6: Future Origins and Destinations
- 7: Projected Future Trail Volumes at Proposed Overcrossing Locations
- 8: Future Vehicle Volumes

Appendix:

- A: Detailed Trail Counts
- B: Detailed Trail Use Estimates
- C: Traffic Operations Analysis Results

Appendix A

Trail Counts

Tuesday, Oct 23 & Saturday, Nov 3

total volumes	Sycamore			El Capitan			Crow Canyon			Bollinger			overall split (all 3)		
	NB	SB	total	NB	SB	total	NB	SB	total	NB	SB	total	NB	SB	total
AM	23	23	46	0	0	0	14	20	34	31	26	57	50%	50%	50%
MD	8	19	27	0	0	0	10	12	22	13	27	40	35%	65%	35%
PM	36	18	54	0	0	0	27	18	45	24	14	38	64%	36%	64%
Sat	35	31	66	52	39	91	46	47	93	37	43	80	49%	51%	49%
all periods	102	91	193	52	39	91	97	97	194	105	110	215			
AM split	50%	50%					41%	59%		54%	46%		50%	50%	
MD split	30%	70%					45%	55%		33%	68%		35%	65%	
PM split	67%	33%					60%	40%		63%	37%		64%	36%	
Sat split	53%	47%					49%	51%		46%	54%		49%	51%	

(total both directions)	AM			Mid-Day			PM			Saturday				
	Pedestr ians	Bicyclists- adult	runners children	other	total									
Sycamore Valley	9	24	5	0	18	7	0	2	27	13	35	0	6	0
El Capitan	13	18	1	4	12	2	4	0	22	4	34	0	7	0
Crow Canyon	42	12	0	13	16	10	1	0	40	10	25	0	3	0
Bollinger Canyon	64	54	6	17	46	19	5	2	89	27	94	0	16	0
total	47%	39%	4%	19%	52%	21%	6%	2%	100%	20%	69%	0%	12%	0%
mode split														

(total both directions)	All Periods			Saturday				
	Pedestr ians	Bicyclists- adult	runners children	Pedestr ians	Bicyclists- adult	runners children	other	total
Sycamore Valley	35	6	109	19	32	0	15	0
El Capitan	19	0	45	19	45	6	20	1
Crow Canyon	39	0	111	18	47	6	21	1
Bollinger Canyon	90	2	96	27	43	0	8	2
total	183	8	361	83	167	12	64	4
total w/out El Capitan	164	8	316	83	167	12	64	4

mode split	Sycamore Valley			El Capitan			Crow Canyon			Bollinger Canyon			
	18% <th>3% <th>56% <th>21% <th>0% <th>49% <th>7% <th>22% <th>1% <th>100% <th>13% <th>3% <th>100% </th></th></th></th></th></th></th></th></th></th></th></th>	3% <th>56% <th>21% <th>0% <th>49% <th>7% <th>22% <th>1% <th>100% <th>13% <th>3% <th>100% </th></th></th></th></th></th></th></th></th></th></th>	56% <th>21% <th>0% <th>49% <th>7% <th>22% <th>1% <th>100% <th>13% <th>3% <th>100% </th></th></th></th></th></th></th></th></th></th>	21% <th>0% <th>49% <th>7% <th>22% <th>1% <th>100% <th>13% <th>3% <th>100% </th></th></th></th></th></th></th></th></th>	0% <th>49% <th>7% <th>22% <th>1% <th>100% <th>13% <th>3% <th>100% </th></th></th></th></th></th></th></th>	49% <th>7% <th>22% <th>1% <th>100% <th>13% <th>3% <th>100% </th></th></th></th></th></th></th>	7% <th>22% <th>1% <th>100% <th>13% <th>3% <th>100% </th></th></th></th></th></th>	22% <th>1% <th>100% <th>13% <th>3% <th>100% </th></th></th></th></th>	1% <th>100% <th>13% <th>3% <th>100% </th></th></th></th>	100% <th>13% <th>3% <th>100% </th></th></th>	13% <th>3% <th>100% </th></th>	3% <th>100% </th>	100%
weighted average mode split	26%	1%	52%	27%	1%	52%	5%	12%	1%	100%	14%	1%	100%
without el Capitan	27%	1%	52%	27%	1%	52%	5%	12%	1%	100%	14%	1%	100%

Appendix B

Future Trail Use Summary

	Sycamore					Crow Canyon					Bohlinger Canyon				
	AM	MD	PM	Sat	average	AM	MD	PM	Sat	average	AM	MD	PM	Sat	average
existing use employment, residential growth effect existing + growth effect estimated recreational % estimated future rec users remove barrier (+25%)	46	27	54	66	48	34	22	45	93	49	57	40	38	80	54
	72	38	34	50		117	38	79	50		173	38	135	80	
	118	65	88	116		151	60	124	143		230	78	173	130	
	65%	75%	75%	100%		65%	75%	75%	100%		65%	75%	75%	100%	
	77	49	66	116		98	45	93	143		149	58	130	130	
	19	12	17	29		25	11	23	34		37	15	32	33	
total of all effects	138	77	105	145	116	176	71	147	179	143	267	93	205	163	182
total # increase	92	50	51	79	68	142	49	102	86	95	210	53	167	83	128
total % increase	199%	186%	94%	120%	150%	416%	224%	228%	93%	240%	369%	131%	441%	104%	261%

AM Directional Split	% NB: 50%	# 68	% SB: 50%	# 69
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AM Directional Split	% NB: 50%	# 87	% SB: 50%	# 88
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AM Directional Split	% NB: 50%	# 133	% SB: 50%	# 135
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AM mode split (based on counts)	Pedestria ns-adults 47%	Bicyclists- adult 39%	Bicyclists- children 4%	runners 7%	other 2%	total 100%	Pedestria ns-adults 47%	Bicyclists- adult 39%	Bicyclists- children 4%	runners 7%	other 2%	total 100%	Pedestria ns-adults 47%	Bicyclists- adult 39%	Bicyclists- children 4%	runners 7%	other 2%	total 100%
rounded	64	54	6	10	3	138	82	69	8	13	4	176	125	105	12	20	6	267
	60	50	5	10	0	125	80	70	10	10	5	175	120	110	10	20	10	270

MD directional split

MD mode split	Pedestria ns-adults 19%	Bicyclists- adult 52%	Bicyclists- children 21%	runners 6%	other 2%	total 100%	Pedestria ns-adults 19%	Bicyclists- adult 52%	Bicyclists- children 21%	runners 6%	other 2%	total 100%	Pedestria ns-adults 19%	Bicyclists- adult 52%	Bicyclists- children 21%	runners 6%	other 2%	total 100%
rounded	15	40	16	4	2	77	14	37	15	4	2	71	20	48	20	5	2	93
	15	40	20	5	0	80	10	40	15	5	0	70	20	50	20	5	0	95

PM directional split

PM mode split	Pedestria ns-adults 20%	Bicyclists- adult 69%	Bicyclists- children 0%	runners 12%	other 0%	total 100%	Pedestria ns-adults 20%	Bicyclists- adult 69%	Bicyclists- children 0%	runners 12%	other 0%	total 100%	Pedestria ns-adults 20%	Bicyclists- adult 69%	Bicyclists- children 0%	runners 12%	other 0%	total 100%
rounded	21	72	0	12	0	105	29	101	0	17	0	147	40	141	0	24	0	205
	20	70	0	10	0	100	25	100	0	15	0	140	35	140	0	20	0	195

Sat directional split

Sat mode split	Pedestria ns-adults 25%	Bicyclists- adult 51%	Bicyclists- children 4%	runners 19%	other 1%	total 100%	Pedestria ns-adults 25%	Bicyclists- adult 51%	Bicyclists- children 4%	runners 19%	other 1%	total 100%	Pedestria ns-adults 25%	Bicyclists- adult 51%	Bicyclists- children 4%	runners 19%	other 1%	total 100%
rounded	37	74	5	28	2	145	45	91	7	35	2	179	41	82	6	32	2	163
	40	70	5	30	0	145	45	90	10	35	0	180	40	80	10	30	0	160

peak direction only

sum of 4 peak hours	19	37	3	14	1	74	23	46	3	18	1	91	63	53	6	10	3	135
		NB 234		SB 231		total 465		NB 294		SB 279		total 573		NB 376		SB 352		total 728

Appendix C

Traffic Operations Analysis Results

2020 PM Baseline
(with at-grade crossing)

HCM Signalized Intersection Capacity Analysis
 14: Bollinger Canyon & Bishop Ranch 1

2020 Baseline
 PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.86		1.00	0.86	1.00	1.00	1.00		0.97	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	0.86	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	6399		1770	6408	1583	1770	1629		3433	1393	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	6399		1770	6408	1583	1770	1629		3433	1393	
Volume (vph)	45	2651	26	90	1426	380	240	30	155	592	10	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	2882	28	98	1550	413	261	33	168	643	11	68
RTOR Reduction (vph)	0	1	0	0	0	174	0	76	0	0	48	0
Lane Group Flow (vph)	49	2909	0	98	1550	239	261	125	0	643	31	0
Confl. Bikes (#/hr)												205
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)	6.4	52.2		6.8	52.6	52.6	17.0	14.7		40.3	38.0	
Effective Green, g (s)	7.4	53.2		7.8	53.6	53.6	18.0	15.7		41.3	39.0	
Actuated g/C Ratio	0.06	0.41		0.06	0.41	0.41	0.14	0.12		0.32	0.30	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	101	2619		106	2642	653	245	197		1091	418	
v/s Ratio Prot	0.03	c0.45		c0.06	0.24		c0.15	0.08		c0.19	0.02	
v/s Ratio Perm						0.15						
v/c Ratio	0.49	1.11		0.92	0.59	0.37	1.07	0.64		0.59	0.08	
Uniform Delay, d1	59.5	38.4		60.8	29.6	26.4	56.0	54.4		37.2	32.6	
Progression Factor	0.57	0.42		0.90	0.56	0.41	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	53.6		60.4	0.9	1.5	75.8	6.6		0.8	0.1	
Delay (s)	36.2	69.8		115.1	17.4	12.2	131.8	61.0		38.1	32.7	
Level of Service	D	E		F	B	B	F	E		D	C	
Approach Delay (s)		69.2			21.0			101.0			37.5	
Approach LOS		E			C			F			D	
Intersection Summary												
HCM Average Control Delay			51.9			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)				6.0		
Intersection Capacity Utilization			85.2%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

Queues
14: Bollinger Canyon & Bishop Ranch 1

2020 Baseline
PM Peak

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	2910	98	1550	413	261	201	643	79
v/c Ratio	0.42	1.09	1.03	0.58	0.49	1.07	0.74	0.59	0.17
Control Delay	39.2	64.8	151.9	17.4	5.2	128.4	35.8	41.1	10.7
Queue Delay	0.0	12.3	0.0	0.3	0.4	0.0	0.0	0.0	0.0
Total Delay	39.2	77.2	151.9	17.7	5.6	128.4	35.8	41.1	10.7
Queue Length 50th (ft)	39	~778	~90	216	37	~242	95	234	7
Queue Length 95th (ft)	m47	#849	m#204	267	46	#418	170	326	45
Internal Link Dist (ft)		607		360			1231		302
Turn Bay Length (ft)	200		250		150			150	
Base Capacity (vph)	123	2660	95	2681	835	245	371	1090	466
Starvation Cap Reductn	0	0	0	429	123	0	0	0	0
Spillback Cap Reductn	0	67	0	0	0	0	1	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	1.12	1.03	0.69	0.58	1.07	0.54	0.59	0.17

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

2020 PM With Overcrossing

HCM Signalized Intersection Capacity Analysis
 14: Bollinger Canyon & Bishop Ranch 1

2020 With Overcrossing
 PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.86		1.00	0.86	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	6399		1770	6408	1583	1770	1629		3433	1622	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	6399		1770	6408	1583	1770	1629		3433	1622	
Volume (vph)	45	2651	26	90	1426	380	240	30	155	592	10	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	2882	28	98	1550	413	261	33	168	643	11	68
RTOR Reduction (vph)	0	1	0	0	0	169	0	87	0	0	61	0
Lane Group Flow (vph)	49	2909	0	98	1550	244	261	114	0	643	18	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)	6.4	65.8		9.6	69.0	69.0	26.7	11.5		27.1	11.9	
Effective Green, g (s)	7.4	66.8		10.6	70.0	70.0	27.7	12.5		28.1	12.9	
Actuated g/C Ratio	0.06	0.51		0.08	0.54	0.54	0.21	0.10		0.22	0.10	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	101	3288		144	3450	852	377	157		742	161	
v/s Ratio Prot	0.03	c0.45		c0.06	c0.24		0.15	c0.07		c0.19	0.01	
v/s Ratio Perm						0.15						
v/c Ratio	0.49	0.88		0.68	0.45	0.29	0.69	0.73		0.87	0.11	
Uniform Delay, d1	59.5	28.2		58.1	18.3	16.4	47.2	57.1		49.1	53.3	
Progression Factor	0.68	0.17		1.11	0.66	0.69	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	2.4		11.6	0.4	0.8	5.4	15.4		10.4	0.3	
Delay (s)	42.8	7.0		76.0	12.5	12.1	52.6	72.5		59.6	53.6	
Level of Service	D	A		E	B	B	D	E		E	D	
Approach Delay (s)		7.6			15.4			61.3			58.9	
Approach LOS		A			B			E			E	
Intersection Summary												
HCM Average Control Delay			20.2				HCM Level of Service				C	
HCM Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)				9.0	
Intersection Capacity Utilization			85.2%				ICU Level of Service				E	
Analysis Period (min)			15									
c Critical Lane Group												

Queues
14: Bollinger Canyon & Bishop Ranch 1

2020 With Overcrossing
PM Peak

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	2910	98	1550	413	261	201	643	79
v/c Ratio	0.42	0.86	0.73	0.44	0.40	0.69	0.83	0.89	0.34
Control Delay	45.7	6.6	91.3	12.5	3.0	55.5	49.2	63.0	19.4
Queue Delay	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0
Total Delay	45.7	6.6	91.3	12.6	3.3	55.5	49.2	63.0	19.4
Queue Length 50th (ft)	42	142	88	183	22	211	87	272	8
Queue Length 95th (ft)	m54	131	m#169	218	29	299	#206	#367	58
Internal Link Dist (ft)		607		360			1231		302
Turn Bay Length (ft)	200		250		150			150	
Base Capacity (vph)	123	3367	136	3530	1036	411	261	741	250
Starvation Cap Reductn	0	3	0	744	195	0	0	0	0
Spillback Cap Reductn	0	16	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.87	0.72	0.56	0.49	0.64	0.77	0.87	0.32

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.