Rohnert Park HIGHWAY 101 BIKE & PEDESTRIAN CROSSING

ROHNERT PARK HIGHWAY 101 BIKE & PEDESTRIAN CROSSING FEASIBILITY STUDY

Rohnert Park

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EXECUTIVE SUMMARY

BACKGROUND

Since its construction in the 1950s, US Highway 101 has divided the City of Rohnert Park and has presented a major barrier to bicycle and pedestrian travel. Improved access is needed because the existing US 101 crossings, at Rohnert Park Expressway and Golf Course Drive, are one mile apart, have many large intersections and conflict points that create risks for bike/ped safety, and have a history of collisions. The need to improve access for non-vehicular travel across US 101 has been formally documented since 1995 and is noted in many local and regional planning documents.

PURPOSE OF STUDY

The purpose of this Study is to assess the feasibility of improving access and safety for cyclists and pedestrians crossing US 101 in Rohnert Park in order to facilitate and encourage non-vehicular travel throughout the City and Region.

SCOPE

This Study evaluates the feasibility of physical improvements at seven existing or potential new crossing locations and assesses numerous possible new overcrossing and undercrossing alignment alternatives. This Study also evaluates potential future usage of a new crossing by both cyclists and pedestrians, as well as the benefits of improved access for cyclists, pedestrians, and disadvantaged communities to access transit, residential neighborhoods, schools, and businesses.

FINDINGS

Improvements to existing crossings at Golf Course Drive and Rohnert Park Expressway would marginally improve safety and access but would not substantially improve overall access for cyclists and pedestrians across US 101 in the City of Rohnert Park.

A new US 101 crossing at either Hinebaugh Creek or Copeland Creek would provide the greatest long-term access benefits for active transportation. The creeks run east-west through central Rohnert Park, are located and adjacent to community-identified destinations, provide a pleasant, quiet, and natural environment for walking and biking, and include well-used bike/ped trails for active transportation and recreation.

Developing either of the existing culvert structures at Hinebaugh and Copeland creeks to serve as a bicycle and pedestrian undercrossing is not feasible due to the inadequate existing hydraulic capacity of the creek channels and culverts.

A new overcrossing at Copeland Creek would provide for greater connectivity to existing north-south and east-west routes at its access points than an overcrossing at Hinebaugh Creek. Moreover, the existing trails along Copeland Creek provide more extensive barrier-free access to the City than the existing trails along Hinebaugh.

A new overcrossing at Copeland Creek is highly feasible:

1. It would not require right-of-way acquisition from private entities;
2. It is constructible over an active freeway;
3. An aesthetically appealing structure that would attract usage is viable;
4. Creek maintenance operations can be accommodated;
5. No major utility or environmental clearance issues are anticipated;
6. Existing unsafe crossings of Commerce Boulevard at Copeland Creek can be addressed; and,
7. The project is likely to compete well for grant funding.

A new crossing at Copeland Creek would be located near the City's central business district and passenger rail station, and serve schools, disadvantaged communities, and high-density multi-family residential complexes. By connecting to the City's north-south Class I path on the east side of US 101, as well as the bike/ped facilities on the west side, the crossing would serve Rohnert Park's residential neighborhoods and commercial area along Commerce Boulevard and Southwest Boulevard, as well as the commercial areas along Redwood Drive.

RECOMMENDATIONS

This Study recommends the development of a new overcrossing of US 101 for pedestrians and cyclists at Copeland Creek. The new overcrossing would connect to the existing Copeland Creek Trail.

This Study recommends a clear-span tied-arch structure type. A clear span would maintain future flexibility for US 101, since it does not require a support in the center of the freeway. A tied arch can be erected with minimal impact to freeway operations and provides greater architectural and aesthetic opportunities, which would be important for building community pride, obtaining stakeholder support, obtaining grant funding, and attracting usage.

This Study recommends the following at-grade safety improvements be developed in advance of, or in conjunction with, the overcrossing: a new at-grade crossing of Commerce Boulevard at Copeland Creek, and culvert extensions to provide for shoulders and sidewalks at both Redwood Drive and Commerce Boulevard.

Additionally, this Study recommends a public connection between the Copeland Creek Trail and Laguna Drive to improve connectivity.

COST SUMMARY

Conceptual cost estimates and possible completion dates for the project are summarized in the table to the right. These are discussed in the Implementation chapter of this Study, which also includes a list of potential funding sources.

Phase	Estimated Cost (2020)	Estimated Completion
Overcrossing Project Initiation	$450,000	2022
Overcrossing PE/Environ	$700,000	2024
Overcrossing PS&E	$2,700,000	2025
At-Grade Improvements	$800,000	2027
Overcrossing Construction	$21,200,000	2027
Agency Support	$4,150,000	2027

1. STUDY PURPOSE & SCOPE

1.1. PROJECT STUDY AREA

1. STUDY PURPOSE & SCOPE

Located along US Highway 101 in central Sonoma County, the City of Rohnert Park is situated approximately six miles south of the City of Santa Rosa and nine miles north of the City of Petaluma. Along its southwest edge, Rohnert Park shares a border with the City of Cotati. With a population of approximately 40,000, a land area encompassing 7.3 square miles, low crime rates, highly ranked schools, and affordable housing, Rohnert Park is regionally known as an ideal family-oriented community.

The relatively flat topography makes Rohnert Park an optimal community for walking and biking. The City's riparian corridors are one of its greatest physical assets, providing opportunities for open space, wooded habitats for wildlife, and shade for a regional network of creek-side multi-use trails.

Rohnert Park's active transportation network provides access to residential neighborhoods, transit, employment, recreational spaces, civic and educational institutions, and essential services throughout the City. However, US 101 is a major barrier to east-west bicycle and pedestrian travel.

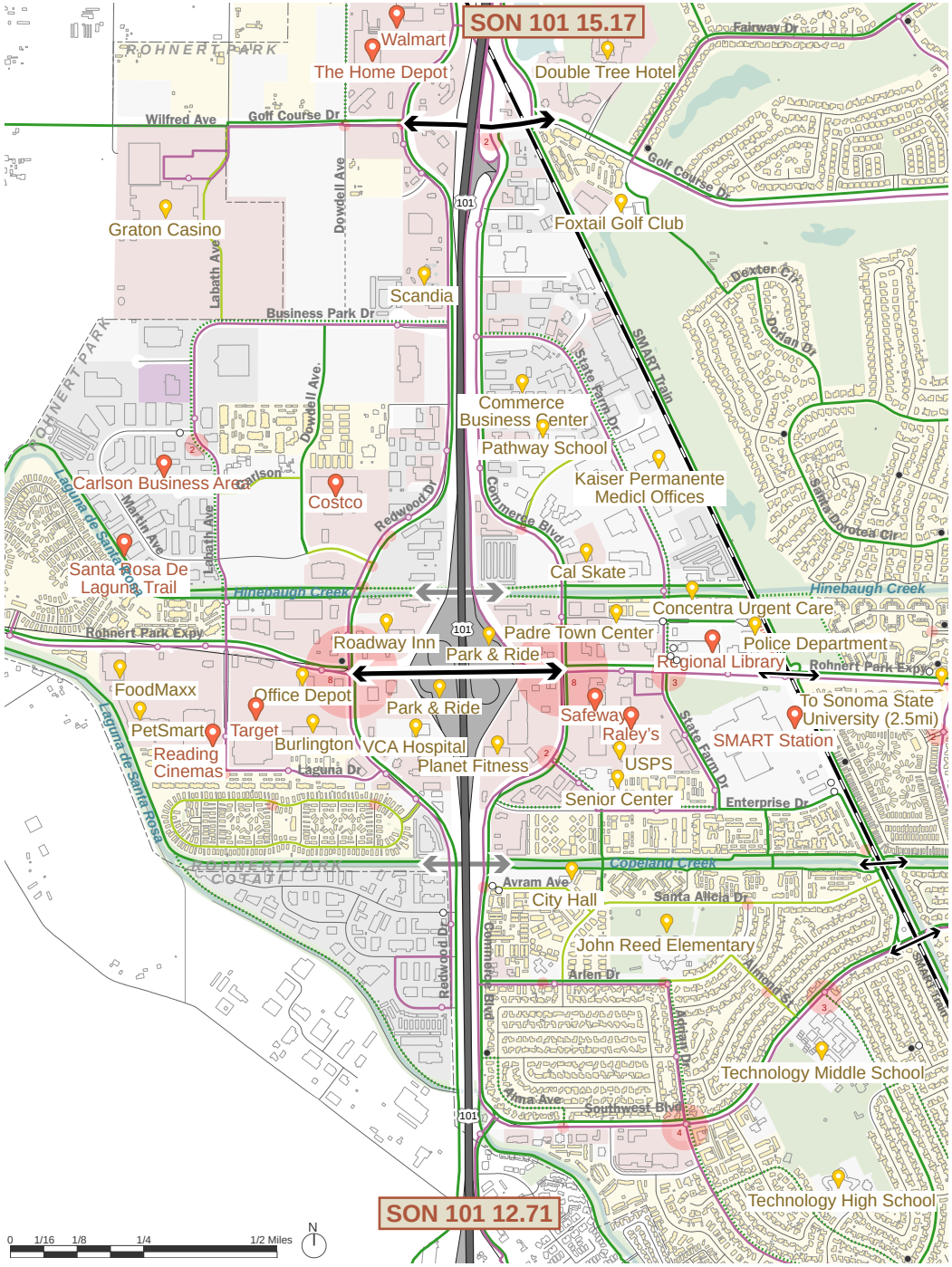
This Study examines potential bike/ped crossings of US 101 that would provide a new non-vehicular route across US 101, eliminate barriers between east and west, close a significant gap in the City's bike/ped network, and allow disadvantaged communities to access key destinations and on opposite sides of the freeway. The primary goals of this Study are to:

1. Identify and evaluate potential US 101 crossing locations;
2. Identify feasible conceptual designs that meet the project purpose and need;
3. Obtain community input and recommend which conceptual design alternatives should be carried forward for environmental analysis and preliminary design; and
4. Provide a preliminary cost estimate and delivery strategy for the recommended conceptual design alternative.
5. Identify where and how the City's bike/ped network can be improved to enhance the benefits of a new US 101 crossing.

1.1. PROJECT STUDY AREA

The study area for this Study extends approximately two miles along US 101 (Postmile SON 15.166 to SON 12.712), where the freeway intersects with Rohnert Park. The interchanges at US 101 and the City's two main arterials, Golf Course Drive and Rohnert Park Expressway, serve as the primary vehicular access points into the City and between the east and west sides. As a result, Golf Course Drive and Rohnert Park Expressway have the highest traffic volumes in the City. Based on average daily traffic data collected in April 2019, Golf Course Drive serves approximately 27,000 vehicles per day, while Rohnert Park Expressway serves approximately 46,000 vehicles per day.

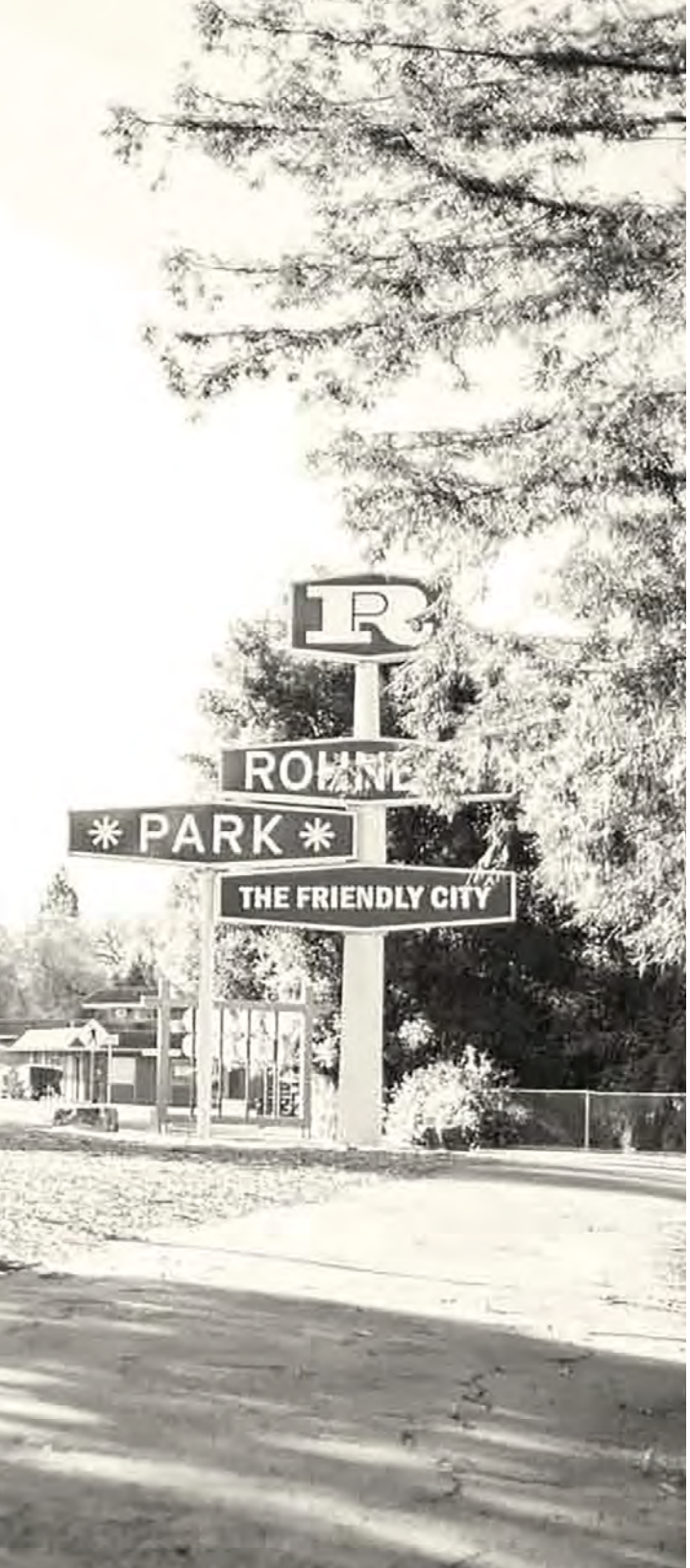
Approximately 700 feet to the north of the US 101 underpass at Golf Course Drive, the Commerce Boulevard underpass also provides a way to cross between the east and west sides of the City, but the route leads into a commercial plaza on the west side and does not provide many additional transportation connections.



LEGEND
- Residential
- Industrial/Office
- Public Green Space
- Mixed Use
- Commercial
- Other
- Creek/Pond
- Bus Network
- Bike Network
- Bike Network (Proposed)
- Existing Bicycle and Pedestrian Friendly Street
- Recommended New Pathway
- Cycling and Walking Destinations
- Most Popular Destinations (2020 survey)
- Working Destination (2020 survey)
- Living area (2020 survey)
- Existing Crossing
- Existing Crossing (Unofficial)
- City Limit
- Number of Cycling and Walking Collisions (2013-2018)

Map of central Rohnert Park and Study Area between Caltrans postmiles (SGA, 2020)

(Photo credit: M. Woolsey)



2. PROJECT BACKGROUND & COMMUNITY CONTEXT

2.1. RELATIONSHIP TO EXISTING DOCUMENTS

2.2. PURPOSE AND NEED

2.3. COMMUNITY CONTEXT

2.4. PUBLIC AND STAKEHOLDER ENGAGEMENT

2. PROJECT BACKGROUND & COMMUNITY CONTEXT

2.1. RELATIONSHIP TO EXISTING DOCUMENTS

Many planning documents have identified the need to improve pedestrian and bicycle access and connections in Rohnert Park, and a new US 101 bike/ped crossing project is specifically listed in several approved transportation plans. In addition to helping the City meet local goals for bike/ped access and connectivity, a new US 101 bike/ped crossing project will help the region meet sustainable community strategies, commitments and performance targets pertaining to climate protection, transportation system effectiveness, healthy and safe communities, and equitable access.

Planning documents that include a new US 101 bike/ped crossing in Rohnert Park are listed below, followed by details of how a new bike/ped crossing is discussed in each document.

1. Rohnert Park General Plan
2. Rohnert Park Active Transportation Plan
3. Sonoma County Bicycle and Pedestrian Master Plan
4. Plan Bay Area
5. Sonoma County Measure M Strategic Plan
6. Sonoma County Comprehensive Transportation Plan
7. Caltrans District 4 Bike Plan and Pedestrian Plan

Rohnert Park General Plan

The 2019 Public Review Draft Alternatives Report of the General Plan update, currently in progress as of 2021, states that the City should **"Develop [a] bike/pedestrian overpass or underpass at Highway 101 and Copeland Creek,"** "Enhance connections between the SMART multi-use path, Hinebaugh Creek Trail, and Copeland Creek Trail," and "Enhance bike/pedestrian facilities on both Hinebaugh Creek Trail and Copeland Creek Trail" (p. 39). The emphasis on enhancing and creating bike/ped connections to the Class I bike/ped creek trails reiterates City policies included in earlier General Plans, such as the importance of extending the creek trails into newly developed areas, providing frequent entrances to the bikeways to increase access, orienting new development towards bikeways in order to activate the space, and considering a new pedestrian crossing of US 101 along Hinebaugh Creek.

The 2019 Transportation Whitepaper, prepared for the purpose of updating the General Plan, states that **the system of Class I bike paths that parallel the east-west creeks, and the SMART Trail, form the "backbone" of Rohnert Park's active transportation network.** The whitepaper identifies US 101 and the Foxtail Golf Club among the primary large-scale linear barriers to bike/ped travel across the City and state that "Class I facilities are proposed to connect gaps in the creek trail system across Highway 101 and across the southern Foxtail Golf Club" (p. 10).

No studies to date have assessed the feasibility of a new bicycle and pedestrian crossing of US 101 at the creek locations, nor the additional demand for a crossing created by new and planned developments, such as the recently completed high-density residential projects in the Stadium Area, the potential Station Avenue project in central Rohnert Park, and the new mixed-use and employment centers planned for the Northwest Specific Plan and Wilfred-Dowdell Specific Plan Areas.

A new US 101 crossing project will support policies in the General Plans to close gaps in the active transportation network, encourage bike/ped travel throughout the City, and enhance access to employment and recreational opportunities.

Rohnert Park Active Transportation Plans

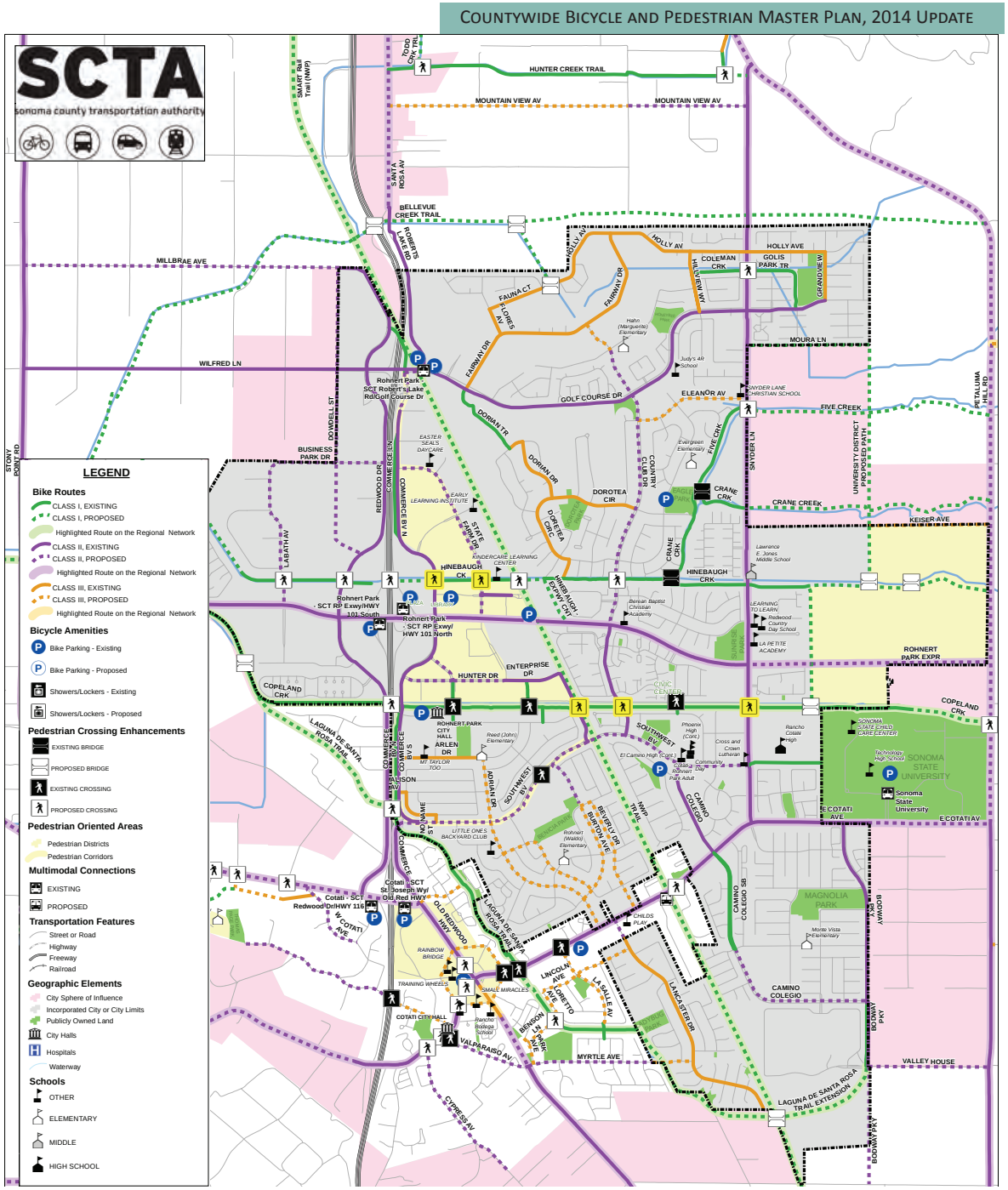
The City adopted a Bicycle Master Plan in 1995 to establish a complete network of bikeways by connecting existing bikeways and closing gaps that discouraged extensive bicycle use. By the time the City adopted its General Plan in 2000, many Class II bike paths outlined in the Master Plan were completed, while some Class I bikeways were also implemented.

In 2008, the City approved its Bicycle and Pedestrian Master Plan, which was developed in coordination with the Sonoma County Transportation Authority (SCTA) for the Countywide Bicycle and Pedestrian Master Plan. The Master Plan acknowledged that "the barriers created by freeways are among the most difficult challenges for bicyclists and pedestrians in many locations" (p.12) and included an extensive list of additional planned bicycle facilities and crossings of major barriers to bicycle travel. Two notable comments included in the Master Plan, recorded during a 2007 public workshop, are that **"Highway 101 is a major barrier. We need to plan access to connect across the highway," and "101 is a major barrier, design many projects to cross 101. Caltrans needs to hear this."**

A new US 101 crossing would address the need for overcoming the barrier created by US 101 and respond directly to calls from community members for a new way to cross US 101. The planning and design of a crossing project would need to be conducted in a close partnership with the Rohnert Park community, local stakeholders, and Caltrans.

Sonoma County Bike & Pedestrian Master Plan

In 2014, SCTA updated the Countywide Bicycle and Pedestrian Master Plan through a process similar to the development of the 2008 Countywide Bicycle and Pedestrian Master Plan. By incorporating most of the 2008 Master Plan and coordinating with local jurisdictions, the 2014 Updated Master Plan includes additional census and collision data, a discussion of the progress in implementing bike/ped improvements and programs, and an updated list of proposed bike/ped projects. **For Rohnert Park, the 2014 Master Plan includes a bike/ped overcrossing of US 101 at Copeland Creek as a "high" priority regional project (#172).** A new bike/ped crossing of US 101 at Hinebaugh Creek is also included in the plan as a "low" priority local project (#171). Additionally, the Master Plan includes several "medium" and "high" priority projects for improving connections on or to the creek trails. Construction of a new bike/ped crossing would implement a high-priority project and help the City and County achieve local and regional goals for bike/ped connectivity and benefits to quality of life.



Rohnert Park existing and proposed bike/ped facilities (SCTA Bicycle and Pedestrian Master Plan, 2014)

#	City / County	Project Corridor/ Street	Begin Point	End Point	Class	Bike / Ped	Length (Miles)	Local (L) Regional (R)	Primary Network	SF Bay Area Regional Route	Use	Cost	Priority
167	Rohnert Park	University District Class I Path - Hinebaugh Creek Trail East	Former City Limit	Petaluma Hill Road	I	Bike / Ped	0.63	L	No	No	Trans/ Rec	$345,859	Low
168	Rohnert Park	University District Class I Path - Scenic Buffer Path	Rohnert Park Expressway	Hinebaugh Creek	I	Bike / Ped	0.29	L	No	No	Trans/ Rec	$157,626	Low
169	Rohnert Park	University District Class I Path Connector	"Loop Road"	Hinebaugh Creek	I	Bike / Ped	0.06	L	No	No	Trans/ Rec	$33,559	Low
170	Rohnert Park	University District Class I Path - North of Hinebaugh Creek	Hinebaugh Creek	Keiser Avenue	I	Bike / Ped	0.25	L	No	No	Trans/ Rec	$137,804	Low
171	Rohnert Park	New Bike/ Pedestrian Path Crossing Hwy 101	Hinebaugh Creek at Hwy 101		I	Bike / Ped		L	No	No	Trans/ Rec	$3,000,000	Low
172	Rohnert Park	Copeland Creek Bike/ Ped Overcrossing @ Hwy 101	Commerce Boulevard	Redwood Drive	I	Bike / Ped	0.06	R	Yes	No	Trans/ Rec	$6,000,000	High

List of proposed bicycle and pedestrian projects for Sonoma County includes crossings of US 101 at Hinebaugh Creek and Copeland Creek (SCTA Bicycle and Pedestrian Master Plan, 2014)

2013 Plan Bay Area

Adopted in 2013, the Metropolitan Transportation Commission's Plan Bay Area (PBA) includes the climate protection goal to reduce per-capita CO2 emissions from cars and light-duty trucks by 15 percent by 2035, as mandated by SB 375. Achieving this goal is directly related to transportation, which according to the EPA, accounts for a third of all CO2 emissions. Of that third, approximately 80% of greenhouse gas (GHG) emissions are a result of vehicle miles traveled (VMTs). Included in PBA's Transportation Air Quality Conformity Analysis, **RTPID 240547 identifies a "new commitment" to "construct [a] bicycle and pedestrian crossing at U.S. 101 and Copeland Creek," which would be complete and operational by 2030.** For Rohnert Park and Sonoma County, **a new US 101 bike/ped crossing project would reduce a reliance on vehicles and help the region achieve its PBA transportation effectiveness targets of decreasing automobile VMT per capita and increasing non-auto mode share.** The project would provide a non-vehicular, bike/ped overcrossing of US 101 that would close a gap in the City's active transportation network, link to existing and proposed bike/ped paths, such as the regional SMART multiuse pathway that connects 10 miles north to Santa Rosa, and connect to transit, such as rail service provided by SMART and bus service provided by Sonoma County Transit and Golden Gate Transit.

Sonoma County 2019 Measure M Strategic Plan

In 2004, Sonoma County voters passed Measure M, the Traffic Relief Act, which implemented a ¼ cent sales tax to address transportation needs throughout the County. Measure M's expenditure plan is very specific on how revenue will be divided, with 4% of its funding devoted to bike/ped projects. Initiated in 2005 and updated biannually, the Sonoma County Transportation Authority's Measure M Strategic Plan is a programming document that provides a snapshot of project statuses, anticipated expenditures, and the commitment of funds to specific projects for five years. Within the category for bike/ped projects, the Strategic Plan highlights the City's completion of Phase 2 of the Copeland Creek Trails improvement project in 2012, which reconstructed approximately 4,600 linear feet of deteriorated sections of the most well-used bike/ped creek trails, including sections adjacent to senior and multi-family housing, and most notably along Rancho Cotate High School and Sonoma State University.

Furthermore, the Strategic Plan highlights bike/ped access across US 101, stating that funding is available to any four of the seven jurisdictions adjacent to or bisected by US 101 through Sonoma County, which seek to identify key east-west access points across the highway. **By developing this Feasibility Study, Rohnert Park is the third jurisdiction to utilize Measure M bike/ped funding in this capacity, along with the City of Santa Rosa and the Town of Windsor.** According to the Strategic Plan, Rohnert Park's project "will include completing a Project Initiation Document for the Class I multi-use ADA accessible crossing after the feasibility study is complete" (p. 98).

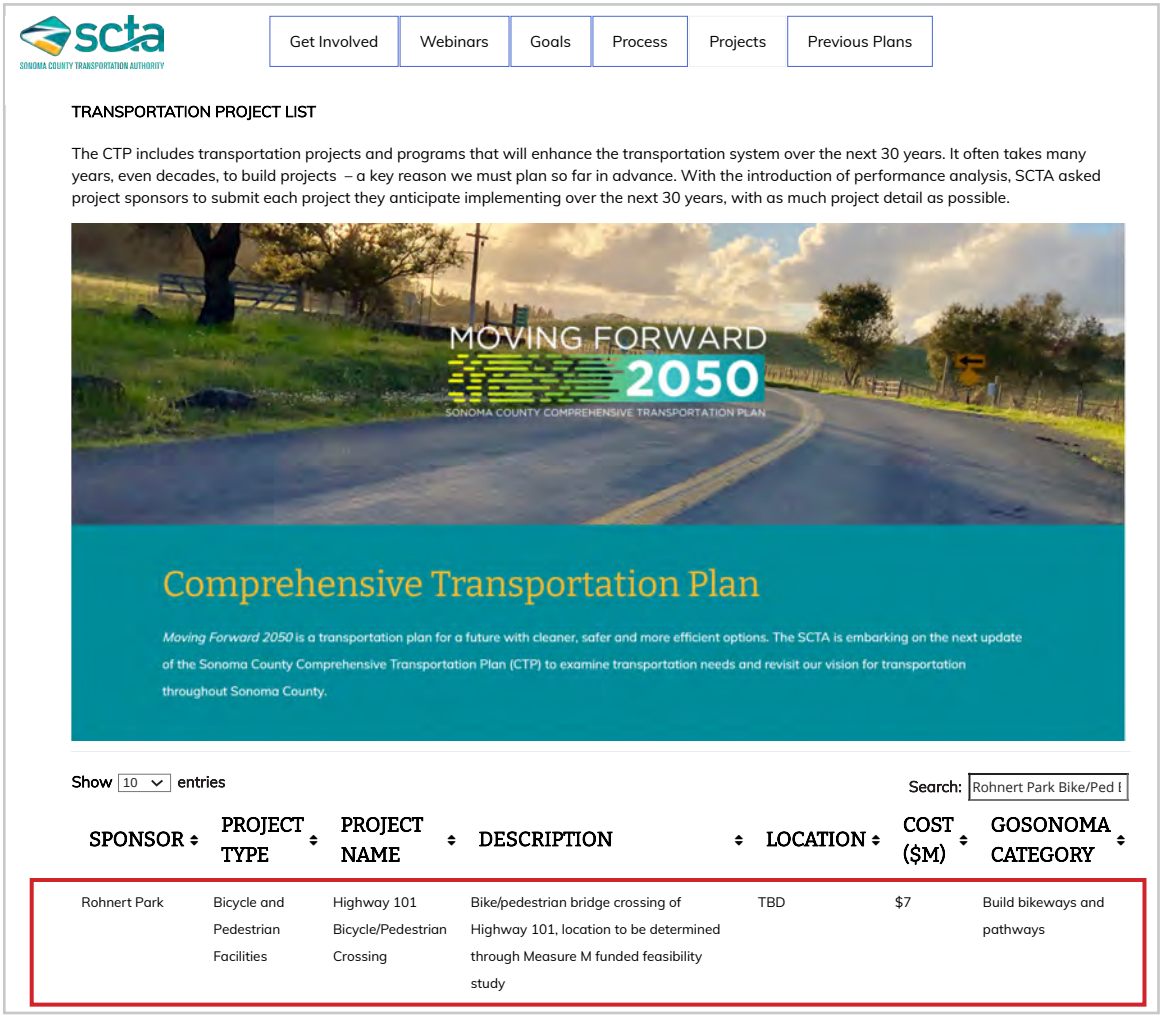
Caltrans District 4 Bike Plan and Pedestrian Plan

Building upon California's 2017 State Bicycle and Pedestrian Plan, Caltrans' 2018 District 4 Bike Plan is the first of its kind in the State to evaluate bicycle needs on and across the State transportation network in the Bay Area. The Bike Plan identifies infrastructure improvements to enhance bicycle safety and mobility and remove some of the barriers to biking in the region. Among the improvements proposed in Sonoma County, **the Caltrans Bike Plan identifies a new separated crossing of US 101 in Rohnert Park as a "top tier project"** (#Son-101-X05).

To complement the Bike Plan, Caltrans District 4 is in the process of preparing a Pedestrian Plan for the Bay Area and released a draft summary report for public review in 2021. The Pedestrian Plan acknowledges that the State's freeways, expressways, and high-speed arterials act as barriers, which often disconnect people from the services and locations they need to access, and have historically been built through, and divided, previously-established communities; especially communities of color. The Pedestrian Plan intends to guide Caltrans investments to support walking in the Bay Area and connect people with opportunities, while seeking to reconnect previously divided communities, and **identifies pedestrian crossings of US 101 at Hinebaugh Creek, Copeland Creek, and Laguna de Santa Rosa as "locally-identified crossings" at the Tier 2 level for intensity of need.** This project will meet the goals of the Caltrans District 4 Bike Plan and Pedestrian Plan to enhance bike/ped safety and mobility and remove the barrier created by US 101, by providing a new grade-separated, non-vehicular ADA-compliant route over US 101 that is a safer alternative to the existing vehicle-centric crossings at Golf Course Drive and Rohnert Park Expressway.

Sonoma County 2016 Comprehensive Transportation Plan

Updated every five years, the 2016 Sonoma County Transportation Authority's Comprehensive Transportation Plan (CTP), Moving Forward 2050, provides the guiding vision for transportation planning in the County. The goals of the CTP are to maintain the transportation system, relieve traffic congestion, reduce greenhouse gas emissions, plan for safety and health, and promote economic vitality. The CTP states that shifting to active transportation modes such as walking, biking, or taking transit provide health benefits by lowering chronic disease rates, reducing obesity, and improving air quality. The CTP also acknowledges that US 101 creates a particularly significant barrier to safe bike/ped travel. **For Rohnert Park, the CTP includes the Copeland Creek Bike/Ped Overcrossing at Highway 101 project in its project needs report (plan ID# 3048), as well as a new bike/pedestrian path crossing project (plan ID# BP171) at Hinebaugh Creek.**



SPONSOR	PROJECT TYPE	PROJECT NAME	DESCRIPTION	LOCATION	COST ($M)	GOSONOMA CATEGORY
Rohnert Park	Bicycle and Pedestrian Facilities	Highway 101 Bicycle/Pedestrian Crossing	Bike/pedestrian bridge crossing of Highway 101, location to be determined through Measure M funded feasibility study	TBD	$7	Build bikeways and pathways

Rohnert Park's new bike/ped crossing of US 101 is included in Sonoma County's Comprehensive Transportation Plan (SCTA Comprehensive Transportation Plan, 2016)

2.2. PURPOSE AND NEED

Purpose

A new crossing would provide pedestrians and cyclists with a safer alternative for crossing US 101 in the vicinity of transit, residential neighborhoods, schools, and businesses, and provide a continuous ADA-compliant Class I pathway to improve east-west connectivity and connect to the existing bike/ped network.

Need

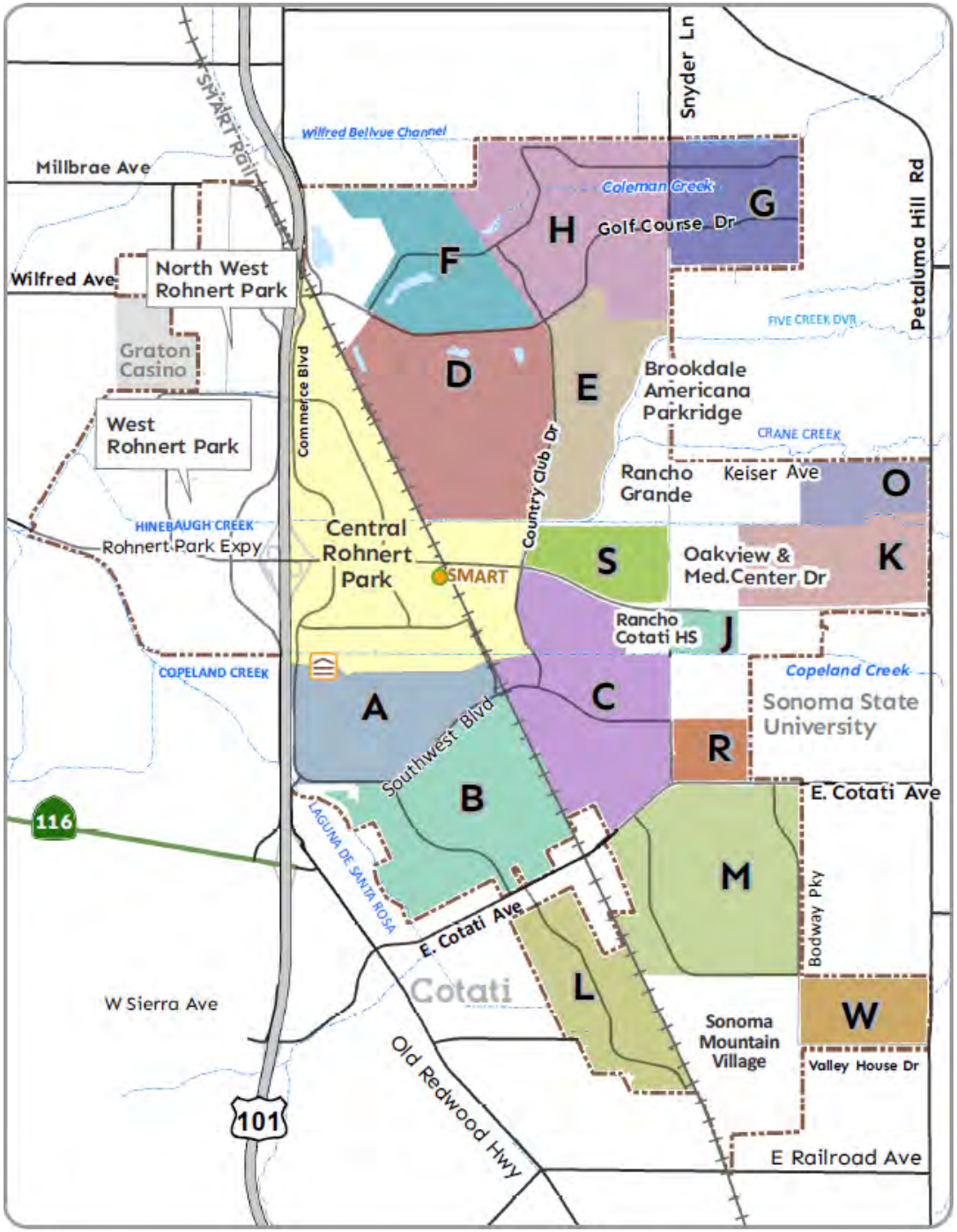
The existing US 101 crossings in Rohnert Park have a history of collisions and pose safety concerns for bike/ped travel, and US 101 creates gaps in the City's existing and extensive active transportation network.

2.3. COMMUNITY CONTEXT

Organized in "Sections"

Incorporated in 1962, Rohnert Park was one of the earliest master-planned communities developed using the concept of the "neighborhood unit." Each neighborhood, known colloquially as "sections," consisted of approximately 250 homes surrounding a school and park, so that residents would not need to walk more than one-third of a mile to a school or open space.

Located on the east side of US 101 and separated by Southwest Boulevard, A and B Sections were the first neighborhood units to be developed in Rohnert Park. From these two sections, the City expanded eastward and northward, before expanding on the west side of US 101 around the 1990s.



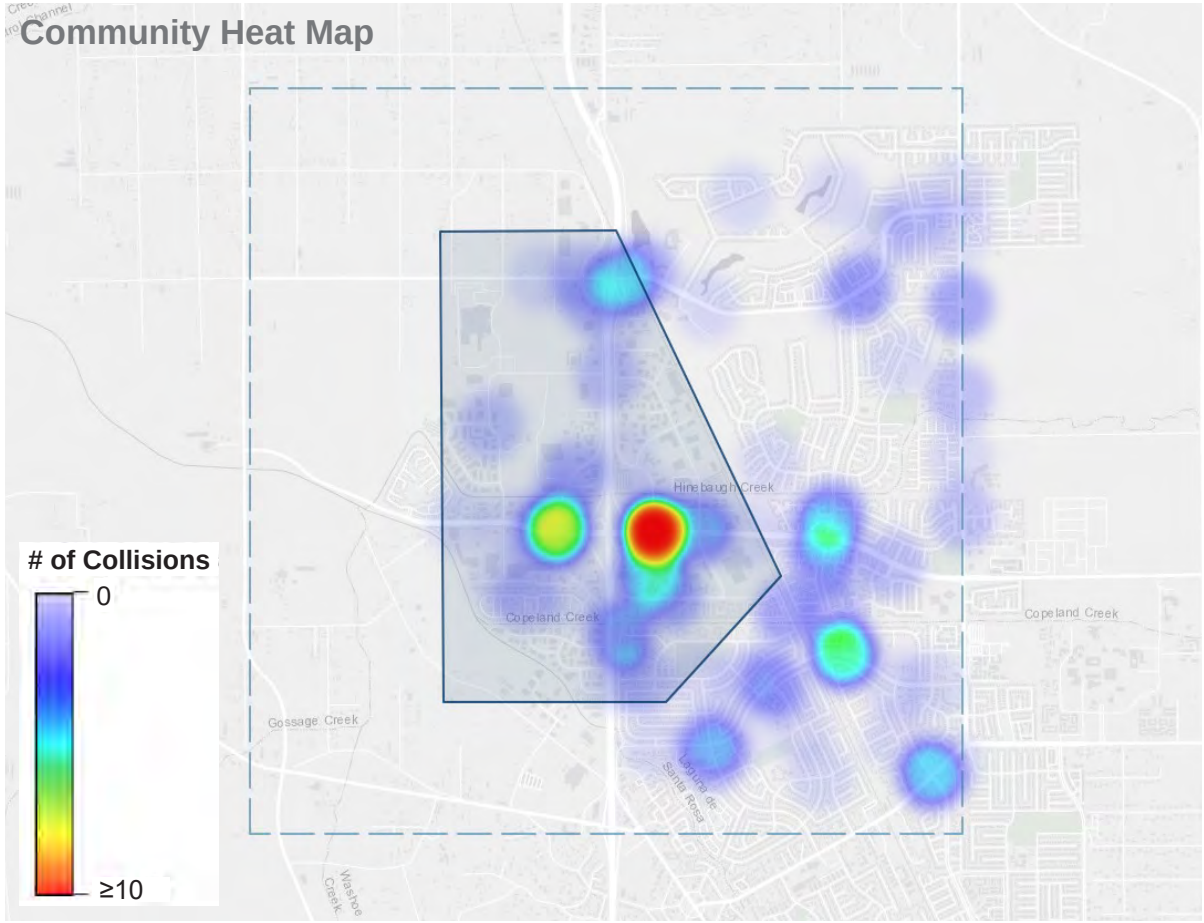
Map of Rohnert Park's Neighborhood Sections (Rohnert Park, 2017)

Divided by Infrastructure

Rohnert Park is a city divided by transportation infrastructure. In the central business district, US 101 divides the City into east and west sides, creates a barrier between communities, degrades urban coherence, and limits accessibility, particularly for cyclists and pedestrians. In Rohnert Park, there are no crossings of US 101 dedicated to bike/ped travel to key destinations near the freeway, such as City Hall, the Rohnert Park Senior Center, the police station, regional library, US post office, John Reed Elementary School, Reading Cinemas, Target, several banks and supermarkets, the Sonoma-Marin Area Rail Transit (SMART) passenger rail station, and the Kaiser Permanente Medical Center.

Existing East-West Bicycle and Pedestrian Crossings Not Safe

The City's existing US 101 crossings are one mile apart, at the Rohnert Park Expressway and Golf Course Drive freeway ramps. These crossings have heavy vehicular traffic, with many potential conflict points for cyclists and pedestrians. As a result, these crossings are prone to collisions and pose a significant risk to cyclist and pedestrian safety.

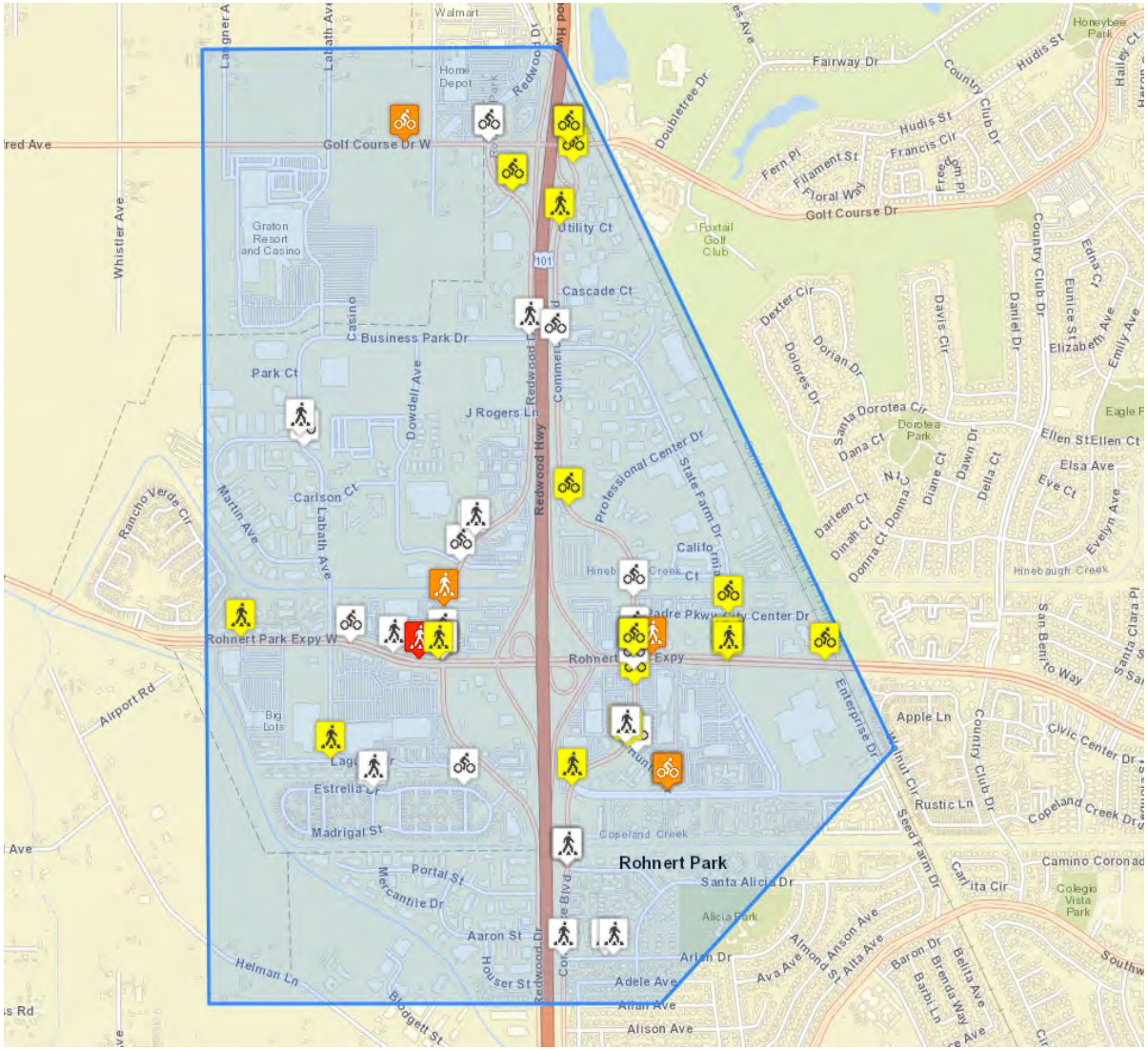


Community heat map of collisions between cars and cyclists and pedestrians from 2008 to 2019 (TIMS, 2020)

The Transportation Injury Mapping System (TIMS), developed by the UC Berkeley Safe Transportation Research and Education Center (SafeTREC), maps out California crash data from the Statewide Integrated Traffic Records System (SWITRS). Data from TIMS show that 69 collisions occurred between 2008 and 2019 involving vehicles with cyclists and pedestrians in central Rohnert Park, in the vicinity of US 101. Of the 69 collisions, one was fatal and 27 resulted in severe or visible injuries. The largest number of collisions (24) occurred within 0.25 mile of the Rohnert Park Expressway freeway crossing, where 16 occurred at the intersections of Rohnert Park Expressway and Redwood Drive and Rohnert Park Expressway and Commerce Boulevard. Additionally, 11 collisions occurred within 0.25 mile of the Golf Course Drive crossing, where five occurred at the intersections of Golf Course Drive and Redwood Drive and Golf Course Drive and Commerce Boulevard.

To the east of the central business district, SMART's right-of-way and railroad tracks extend from the northwest of the City to the southeast, further dividing the City. The Foxtail Golf Club, located between Golf Course Drive and Rohnert Park Expressway, adjacent to the east side of the SMART tracks, also creates a barrier between the central business district and residential neighborhoods. In addition to the existing vehicle-centric crossings of the tracks located Golf Course Drive, Rohnert Park Expressway, and Southwest Boulevard, the only bike/ped crossings of the tracks are located at Copeland Creek.

Project Area Collision Map: 69 total collisions



Locations and details of collisions between cars and cyclists and pedestrians from 2008 to 2019. Colors: Red - Fatal; Orange - Severe Injury; Yellow - Visible Injury; White - Complaint of Pain (TIMS, 2020)

Involved With	Fatal	Severe Injury	Visible Injury	Complaint of Pain	Total
Bicycle	0	3	12	23	38
Pedestrian	1	4	8	18	31

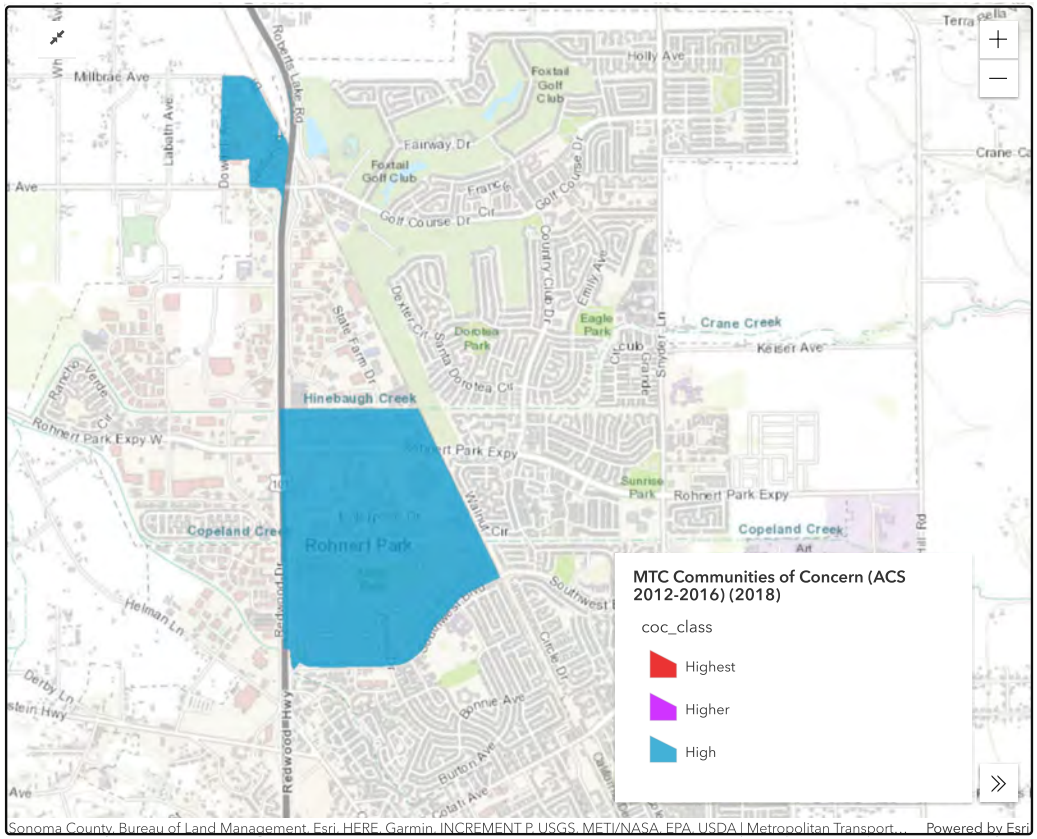
Best Bike/Ped East-West Route Interrupted by US 101

Copeland Creek and Hinebaugh Creek are City's two main waterways that flow east-west from the Sonoma Mountain Range to the Laguna de Santa Rosa, and provide adjacent well-used bike/ped trails for active transportation and recreation. Whereas both creek trails extend between the east and west limits of the City, the Copeland Creek Trail is paved, continuous, and interrupted only by US 101. The Hinebaugh Creek Trail includes unpaved portions and is discontinuous due to US 101, the SMART tracks, and the golf course.

Disadvantaged Communities

On the east side of US 101, and centered on Copeland Creek, census tract 1513.05 includes A-Section, which encompasses John Reed Elementary School, the multi-family housing and senior communities on both sides of the creek, and the 90-unit Bella Creek multi-family residential project currently under construction, which includes seven low-income units. With a median household income (MHI) of $52,375, this tract is identified as a Disadvantaged Community (DAC), based on the Caltrans Active Transportation Program's criteria of having an MHI of less than 80% of the statewide median.

MTC Communities of Concern in 2018 (ACS 2012-2016)



Map of Communities of Concern in Rohnert Park (MTC, 2020)

Census tract 1513.05 is also identified by the Sonoma County Department of Health Services as a "priority place," and by the MTC as a community of "high" concern. The MTC defines Communities of Concern (COC) based on percentage thresholds for eight ACS 2012-2016 tract-level variables:

1. Income of less than 200% of the Federal poverty level, 30%
2. Minority, 70%
3. Elderly over 75 years old, 10%
4. Disabled, 12%
5. Single-Parent Households, 20%
6. Rent-Burdened Households, 15%
7. Zero-Vehicle Households, 10%
8. Level of English Proficiency, 12%

A tract is identified as a COC if it exceeds both threshold values for low income and minority, or if it exceeds the threshold value for low income and also exceeds the threshold values for three or more variables. Tract 1513.05 is a COC because it exceeds thresholds for low income (48%), rent-burdened households (29%), single-parent households (21%), disabled residents (16%), and zero-vehicle households (11%). This data is consistent with the Healthy Places Index (HPI), in which this tract ranks low (28th percentile) for access to automobiles. Based on HPI data for this tract, 19.83% of low-income homeowners (15th percentile), and 30.23% of low-income renters (36th percentile) pay more than half of their income on housing costs. Furthermore, this tract has a lower percentage of adults aged 18 to 64 years who have health insurance (30th percentile). Nevertheless, this tract ranks in the middle (53rd percentile), for active commuting by transit, walking, or biking.

On the west side of US 101, block group 5 of census tract 1512.01 includes the Rancho Feliz Mobile Home Park and the Edgewood Apartments, as well as industrial and rural parts of the City of Cotati. This block group is identified as a DAC, with an MHI of $47,120. Although HPI data indicates that this area ranks in the middle (48 percentile) for healthy places, it is important to note that the data is aggregated at the census tract level, which encompasses approximately 11 square miles and has a low population density (approximately 600 people per square mile).

For the residents in the DACs on the east and west sides of the freeway, who already rely on active transportation and devote a large amount of their income to housing costs, access to a new bike/ped crossing would significantly improve access opportunities and quality of life.

#	Project Name	Total Units	Affordable Units	Deed Restricted (ELI)	(VLI)	(LI)	(MI)
	AFFORDABLE RENTALS						
1	Altamont Apartments	230	106	0	23	83	0
2	Arbors Apartments	56	56	0	22	34	0
3	Copeland Creek Apartments	171	170	0	17	153	0
4	Edgewood Apartments	168	68	0	0	68	0
5	Magnolia Townhomes	20	7	0	0	0	7
6	Muirfield Apartments	24	24	0	0	10	14
7	Park Gardens II	20	3	0	1	2	0
8	Windsor at Redwood Creek	232	35	0	0	35	0
9	Redwoods at University District	218	218	0	109	109	0
10	The Gardens (Santa Alicia)	20	20	0	8	12	0
11	Tower Apartments	50	49	0	49	0	0
12	Vida Nueva	24	24	0	24	0	0
13	Willowglen (Rental)	36	36	6	12	17	1
14	Bella Creek	90	7		7		
	Total	**1233**	**823**	**6**	**268**	**506**	**21**
	MOBILE HOME PARKS						
15	Las Casitas de Sonoma	126	63	0	25	38	0
16	Rancho Feliz	297	178	0	59	119	0
17	Valley Village	285	114	0	57	57	0
18	Rancho Verde	170	0	N/A			
19	Rancho Grande	300	0	N/A			
	Total	**1178**	**355**	**0**	**141**	**214**	**0**
	AFFORDABLE OWNERSHIP PROJECTS						
20	Centreville	2	2	0	0	2	0
21	Willowglen (Ownership)	36	36	0	0	18	18
	Total	**107**	**38**	**0**	**0**	**2**	**4**

Map Source: Google Earth, 2020; PlaceWorks, 2021.

Rohnert Park Affordable Housing

Updated 1-4-2021

Notes: (ELI) - Extremely Low Income (LI) - Low Income
(VLI) - Very Low Income (MI) - Moderate Income
Status for all sites is active unless noted under construction.

0 3,000
Scale (Feet)

Map of Affordable Housing in Rohnert Park (Rohnert Park, 2021)

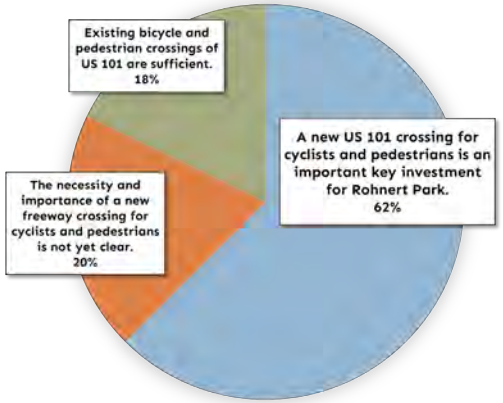
2.4. PUBLIC AND STAKEHOLDER ENGAGEMENT

In June 2020, an online survey was opened to solicit community input about the project. Information about the Study, project, and survey link was posted on the City's main webpage, social media pages, and emailed to the City's bike/ped e-newsletter listservs.

Out of a total of 65 respondents, most were over the age of 45 and had lived in the City for more than 10 years. 88% reported that they cycle outdoors, and 90% walk, run, or jog, usually with other adults and/or pets. Approximately two-thirds of survey respondents that a new crossing would be an important investment for the City, with safety and security being the top design priorities. The remaining third were either unsure about a new crossing or believed that the existing crossings at Rohnert Park Expressway and Golf Course Drive were adequate.

PUBLIC INPUT SURVEY RESULTS

How important is it to you to improve bicycle and pedestrian connectivity between the east and west sides of US 101 in Rohnert Park?



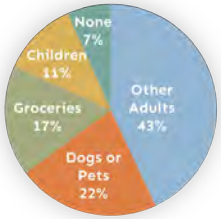
Top Three Personal Priorities for a Highway 101 Bike/Ped Crossing

1. A new or improved crossing should be located and configured to minimize interactions with automobiles. (73%)
2. When I use a bicycle and pedestrian crossing, I should be able to clearly see other people around me and who I am approaching, and it should also be well-lit at night. (66%)
3. A new or improved crossing should be wide enough so that fast cyclists do not need to ride where pedestrians and other slower users are. (50%)

Do you walk, jog, or run outdoors?

Do you cycle outdoors?

Do you cycle, walk, or jog with any of the following?



Example results from the June 2020 Public Input Survey (SGA, 2020)

Half of the respondents had used the existing crossings and would use the facilities more if bike/ped improvements were made, such as adding lighting, landscaping, and aesthetic treatments.

Although 42% of respondents had crossed informally under US 101 using the culverts along Copeland Creek or Hinebaugh Creek, over 75% would use the facilities if the routes were formalized and improved.

According to respondents, the top bike/ped destinations in the study area center on the commercial core along Rohnert Park Expressway. These destinations include the Target and movie theatre shopping area and the creek trails on the west side of US 101, and the Safeway and Raley's shopping area, Rohnert Park Cotati Regional Library, and SMART station and multi-use pathway on the east side of US 101. At the north end of the study area, adjacent to Golf Course Drive and US 101, the Walmart and Home Depot shopping area was identified as a top destination.

Based on write-in responses, people described the City as a nice and friendly bedroom community or commuter town, but without a center or downtown. Written feedback also indicated a strong desire for the City to improve the creek trails, which the City in the process of accomplishing.

Public Meetings

Public meetings were conducted with the Rohnert Park Bicycle and Pedestrian Advisory Committee (BPAC) on December 14, 2020, and with the BPAC and Planing Commission on March 25, 2021, to present the project and receive input.

On May 6, 2021, an online Public Workshop was conducted to update the community about the Study and gather feedback. Excluding panelists, 18 people attended the event. Twelve attendees stated that they work in Rohnert Park, including nine who also live in Rohnert Park. Four attendees neither live nor work in Rohnert Park, but three of the four either live or work in area (i.e., Santa Rosa, Cotati, Penngrove).

Based on the results of live polling conducted during the Workshop, approximately half of respondents completed a survey about the Feasibility Study or attended a previous meeting about it. The remaining half were divided among those who were either hearing about the Study for the first time, or who only heard it mentioned in the past. Additionally, 94% of respondents expressed that a new bicycle and pedestrian overcrossing of US 101, to improve connectivity between the east and west sides, would be important for the City, provided that outside funding is used.

On October 26, 2021, the Study was presented to the members of the Rohnert Park City Council, who unanimously supported the project. Councilmembers' comments and actions are discussed in detail in the Design Recommendations chapter.

Agency Meetings

During this Study, three agency coordination meetings were also conducted with Sonoma Water, and one early coordination meeting was conducted with Caltrans District 4 staff.

See Appendix A for survey responses, meeting minutes, and additional public outreach materials.

ONLY

3. DESIGN CONSTRAINTS & GUIDELINES

3.1. GEOMETRIC SITE CONSTRAINTS

3.2. REQUIREMENTS AND GUIDELINES

3. DESIGN CONSTRAINTS & GUIDELINES

This chapter summarizes the relevant design code-related constraints and guidelines for potential design solutions.

3.1. GEOMETRIC SITE CONSTRAINTS

Vertical Clearance over Freeway and Frontage Roads
The minimum required vertical clearance between the traveled way surface of US 101 and the soffit of a bike/ped overcrossing (BPOC) is 18.5 feet. This is because the California Department of Transportation (Caltrans) Highway Design Manual (HDM) Index 309.2(1)(a) for major structures states, "Freeways and Expressways, All construction except overlay projects – **16 feet 6 inches shall be the minimum vertical clearance over the roadbed of the State facility (e.g., main lanes, shoulders, ramps, collector-distributor roads, speed change lanes, etc.)**" (boldface in original).

The 16.5 feet clearance is supplemented by HDM Index 309.2(2) or minor structures, which states **"Pedestrian over-crossings shall have a minimum vertical clearance 2 feet greater than the standard for major structures for the State facility in question"** (boldface in original).

The minimum required vertical clearance between the traveled way surface of local highway frontage roads, e.g., Redwood Drive and Commerce Boulevard, and the soffit of a BPOC, is 17 feet. This is because HDM Index 309.2(1)(a) for major structures states, "Conventional Highways, Parkways, and Local Facilities, All Projects – **15 feet shall be the minimum vertical clearance over the traveled way and 14 feet 6 inches shall be the minimum vertical clearance over the shoulders of all portions of the roadbed**" (boldface in original), which is also supplemented by the additional 2 feet clearance for minor structures.

US 101 Clear Recovery Zone
HDM Index 309.1(2) describes a Clear Recovery Zone (CRZ) as an unobstructed, relatively flat or gently sloping area beyond the edge of the traveled way that affords the drivers of errant vehicles the opportunity to regain control. According to the HDM, a minimum CRZ width of 30 feet is desirable adjacent to freeways and expressways. If necessary fixed objects are located within the CRZ, they should be eliminated, made to be yielding or breakaway, or shielded by guardrail, barrier, or a crash cushion. For all objects closer to the edge of the traveled way than the CRZ, the minimum horizontal distance shall be equal to the standard shoulder width of the highway facility (10 feet for US 101).

Access and Clearance over Sonoma Water Maintenance Roads

Through its Stream Maintenance Program, Sonoma Water performs maintenance activities along County waterways, which include Hinebaugh Creek and Copeland Creek. Based on discussion with Sonoma Water, the Agency's activities include creek maintenance for flood control, fire fuel reduction, public safety, etc. Therefore, access and vertical clearance for maintenance vehicles, chipper trucks, tandem-axle dump trucks, and equipment to haul out silt is required along the Agency's maintenance roads, which run parallel to the top of creek banks and also serve as creek trails.

Clearance from Power Lines

For personal safety and to reduce the risk of fire, adequate clearance must be provided from electrical wires, or the wires would need to be relocated. According to Pacific Gas and Electric (PG&E), at least 10 feet of clearance must be provided around power lines.

Aerial view of Copeland Creek on the west side of US 101, showing paved maintenance roads that allow Sonoma Water to access the creeks (SGA, 2021)

3.2. REQUIREMENTS AND GUIDELINES

Class I Pathway Width

HDM Index 1003.1(1)(a) states "**The minimum paved width of travel way for a two-way bike path shall be 8 feet,** 10-foot preferred," and "Where heavy bicycle volumes are anticipated and/or significant pedestrian traffic is expected, the paved width of a two-way bike path should be greater than 10 feet, preferably 12 feet or more" (boldface in original).

For paths on structures, HDM Index 1003.1(3) states "**The clear width of a bicycle path on structures between railings shall be not less than 10 feet.** It is desirable that the clear width of structures be equal to the minimum clear width of the path plus shoulders (i.e., 14 feet)" (boldface in original).

Horizontal Clearance

HDM Index 1003.1(1)(b) states "**A minimum 2-foot wide shoulder, composed of the same pavement material as the bike path or all weather surface material that is free of vegetation, shall be provided adjacent to the traveled way of the bike path when not on a structure**" (boldface in original).

Furthermore, HDM 1003.1(3) states "**A minimum 2-foot horizontal clearance from the paved edge of a bike path to obstructions shall be provided**" and "3 feet should be provided" (boldface and underline in original). The HDM states "Adequate clearance from fixed objects is needed regardless of the paved width. If a path is paved contiguous with a continuous fixed object (e.g., fence, wall, and building), a 4-inch white edge line, 2 feet from the fixed object, is recommended to minimize the likelihood of a bicyclist hitting it.

Based on the above, a BPOC is not required to include shoulders, but must have a clear width of at least 10 feet. Since BPOCs are paved between railings or walls, 4-inch white edge lines should be striped along the outer edges of the pathway, 2 feet from the railings or walls.

Vertical Clearance

HDM Index 208.6 states "The minimum vertical clearance of a pedestrian undercrossing should be 10 feet. Skewed crossings should be avoided" (underline in original).

For Class I bikeways, HDM 1003.1(3) states "**The vertical clearance to obstructions across the width of a bike path shall be a minimum of 8 feet and 7 feet over shoulder. Where practical, a vertical clearance of 10 feet is desirable**" Where practical, a vertical clearance of 10 feet is desirable" (boldface in original).

According to the ADA section 307.4 regarding protruding objects in circulation areas, vertical clearance shall be 80 inches (2030 mm) high minimum, and guardrails or other barriers shall be provided where the vertical clearance is less than 80 inches (2030 mm) high.

Horizontal Alignment and Superelevation

According to HDM 1003.1(10), the minimum radius of curvature negotiable by a bicycle should be 90 feet for 20 miles per hour, 160 feet for 25 mile per hour and 260 feet for 30 miles per hour, and the maximum superelevation rate is 2 percent.

When curve radii are smaller than those given due to right of way, topographical, or other considerations, standard curve warning signs and supplemental pavement markings should be installed, and the negative effects of nonstandard curves can also be partially offset by widening the pavement through the curves.

Design Speed and Sight Stopping Distance

Table 1003.1 of the Caltrans Highway Design Manual requires that bicycle and pedestrian pathways, where mopeds are prohibited, be designed for a 20 mph design speed. Section 1003.1.11 of the Caltrans Highway Design Manual requires, for a 20 mph design speed, a sight stopping distance of 125 feet to avoid obstructions along the path of travel. The AASHTO Guide for the Development of Bicycle Facilities, 4th Edition, 2012, Figure 5-7 requires a 200-foot sight stopping distance for a 5% descending slope (0.05 grade) and 20 mph design speed, and 250 feet for an 8% descending slope (0.08 grade).

Pathway Slopes and ADA

HDM 1003.1(14) states that the maximum grade rate recommended for bike paths should be 5 percent, and that bike path grades must meet Caltrans' Design Information Bulletin 82-06 (DIB 82), Pedestrian Accessibility Guidelines for Highway Projects.

According to Section 4.3.4(1) of DIB 82, flat resting areas at least 5 feet in length, must be provided at intervals of 400 feet maximum, for all pathways with continuous gradients, and any part of a pedestrian access route with a slope greater than 1V:20H, or 5 percent, shall be considered a ramp. DIB 4.3.7 states that as a ramp, the slope must not exceed 1V:12H, or 8.3 percent, and must not exceed a 30-inch rise without landings.

The Americans With Disabilities Act, Section 405.7, requires the landing clear length to be 60 inches long minimum in the direction of travel. However, the bottom landing length shall be not less than 72 inches.

Fencing over State Right-of-Way

Referred to as type of "pedestrian railing" in the HDM, fences reduce the risk of objects being dropped on the State roadway below. HDM 208.10(2) states "To reduce the risk of objects being dropped or thrown upon vehicles, protective screening in the form of fence-type railings should be installed along new overcrossing structure sidewalks in urban areas (Sec. 92.6 California Streets and Highways Code)" (underline in original). Figure 208.10C in the HDM provides examples of typical fence-type pedestrian railings for bridge structures within the State right-of-way.

Bicycle Rails, Handrails, and Edge Protection

The height of a bicycle rail or pedestrian guard shall not be less than 42 inches, measured from the top of the traveled way surface (HDM 208.10(6), DIB 82 4.3.11).

DIB 82 4.3.10 states that ramp runs with a rise greater than 6 inches shall have handrails. Handrails shall be provided on both sides of stairs and ramps, and the top of handrail gripping surfaces shall be mounted between 34 inches and 38 inches above the ramp surface. Note that if the slope of a pathway is less than 5% then it is not considered to be a ramp, so railings are not required.

According to DIB 82 4.3.12, a curb or barrier, at least 2 inches high, shall be provided along ramps that prevents the passage of a 4-inch diameter sphere, where any portion of the sphere is within 4 inches of the finish floor or ground surface. To prevent wheel entrapment, the curb or barrier shall provide a continuous and uninterrupted barrier along the length of the ramp.

4. ASSESSMENT OF POTENTIAL CROSSING LOCATIONS

4.1. GOLF COURSE DRIVE

4.2. BUSINESS PARK DRIVE AND STATE FARM DRIVE

4.3. INDUSTRIAL PARK AREA

4.4. HINEBAUGH CREEK

4.5. ROHNERT PARK EXPRESSWAY

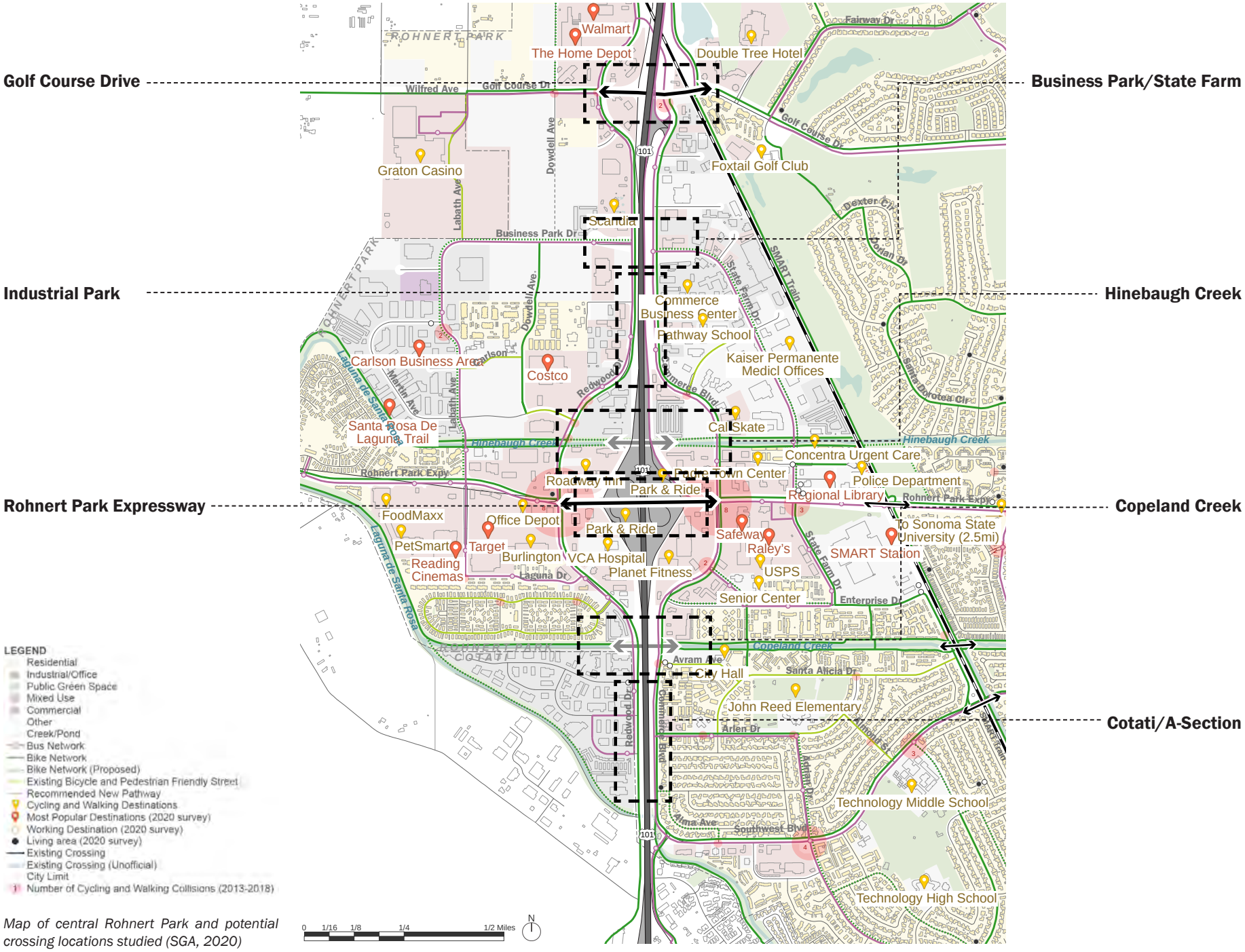
4.6. COPELAND CREEK

4.7. COTATI / A-SECTION

4.8. LOCATIONS ASSESSMENT SUMMARY

4. ASSESSMENT OF POTENTIAL CROSSING LOCATIONS

As discussed in the Study Purpose and Scope chapter, the approximate study area for the project extends approximately two miles along US 101, where the freeway intersects with Rohnert Park. Within the study area, seven locations for a potential bike/ped crossing were assessed.



Map of central Rohnert Park and potential crossing locations studied (SGA, 2020)

4.1. GOLF COURSE DRIVE

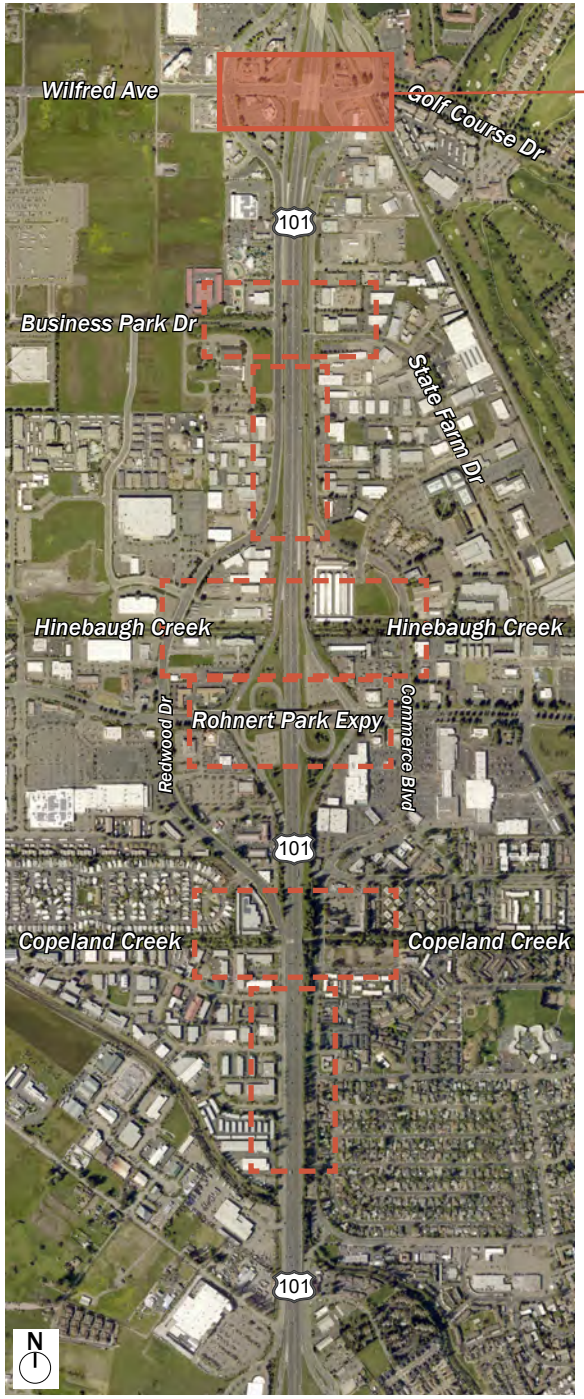
In northern Rohnert Park, Golf Course Drive is a major east-west thoroughfare that allows community members to access US 101, cross between the east and west sides of the City, and cross the SMART right-of-way. The underpass, which opened in 2012, is approximately 100 feet wide, has eight lanes of traffic, a posted speed limit of 40 mph, and serves approximately 27,000 vehicles per day.

For pedestrians, the existing Golf Course Drive underpass includes 6-foot-wide sidewalks with unpaved shoulders of approximately 30 feet on the north side and 20 feet on the south side. The columns of the freeway overpass structure serve as a separation between vehicles and the pedestrian facilities. However, the underpass is approximately 160 feet long, dark, noisy, and uninviting.

For cyclists, the Golf Course Drive underpass includes 8-foot-wide bike lanes. However, cyclists must cross with vehicles that turn right onto the freeway on-ramps or onto the Redwood Drive and Commerce Boulevard frontage roads. Additionally, the 8-foot-wide bike lanes through the underpass narrow into 4-foot bike lanes just beyond the intersections with the frontage roads, forcing cyclists to travel closer to vehicles. On the north side of Golf Course Drive, bike/ped facilities are also intersected by three gas station driveways, in addition to the intersections with freeway ramps, frontage roads, and SMART railroad.

Approximately 700 feet north of Golf Course Drive, the US 101 underpass at Commerce Boulevard was northern Rohnert Park's original US 101 crossing, prior to 2012, and also accommodates the SMART railroad. The crossing currently exists as an additional way for people to pass between the east and west sides of US 101, and is particularly useful for accessing the Home Depot and Walmart shopping area immediately west of US 101, which Commerce Boulevard leads into. For pedestrians, the sidewalk through the underpass is approximately 340 feet long and uninviting, and for cyclists, no bicycle facilities exist on the two-lane roadway. As an east-west route, using the underpass adds an additional 0.25 mile to travel between the frontage roads, as compared to using the Golf Course Drive underpass.

Given its heavy vehicular traffic, history of collisions, and many intersections and conflict points, the Golf Course Drive underpass area is a high-stress environment that has a high risk to bike/ped safety. Although the existing underpass at Golf Course Drive could be improved to better facilitate safer and more inviting bicycle and pedestrian travel, as discussed in this Study under improvements for future study, it is not feasible to change the inherent nature of the vehicle-dominated intersections. Located at the northern edge of the City, a new crossing at this location would also serve fewer people. For these reasons, a new bike/ped crossing at Golf Course Drive was eliminated from further study.



Top: Existing space between support columns and retaining wall provide adequate width for potential protected bike/ped facilities (SGA, 2020)

Center: Inset map of Golf Course Dr area, with solid green lines indicating existing bike/ped facilities, and dashed lines indicating potential future facilities (SGA, 2020)

Bottom: Existing eastbound conditions along Golf Course Dr at US 101 are uninviting for cyclists and pedestrians (SGA, 2020)

4.2. BUSINESS PARK DRIVE AND STATE FARM DRIVE

The Business Park Drive and State Farm Drive crossing location is situated approximately 0.5 mile south of the existing Golf Course Drive undercrossing of US 101 and 0.5 mile north of the existing Rohnert Park Expressway overpass.

Currently, the west side of US 101 at this location is characterized by large parcels of empty land, Graton Resort, and a few businesses along the Redwood Drive frontage road, such the Santa Rosa Press Democrat, Scandia Family Fun Center, a tire shop, a fast-food restaurant, and a sporting goods store. New high-density residential development was recently constructed along Dowdell Avenue approximately 0.3 miles to the southwest, adjacent to an industrial and office area.

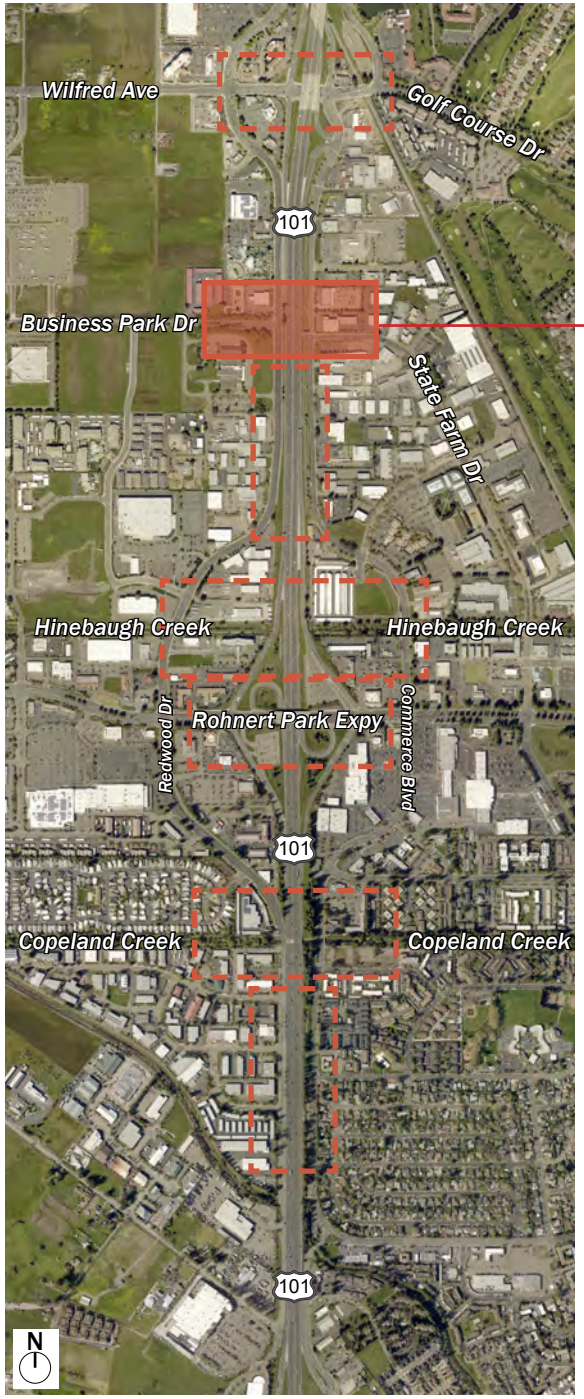
While land uses on the west side near Business Park Drive are becoming more residential, the east side is built out and unlikely to change substantially in the future. On the east side of US 101, the area is largely characterized by industrial and auto-body businesses, single-story offices, and a few fitness centers. A large digital billboard, which also serves as a sign for the City, is located between US 101 and Commerce Boulevard.

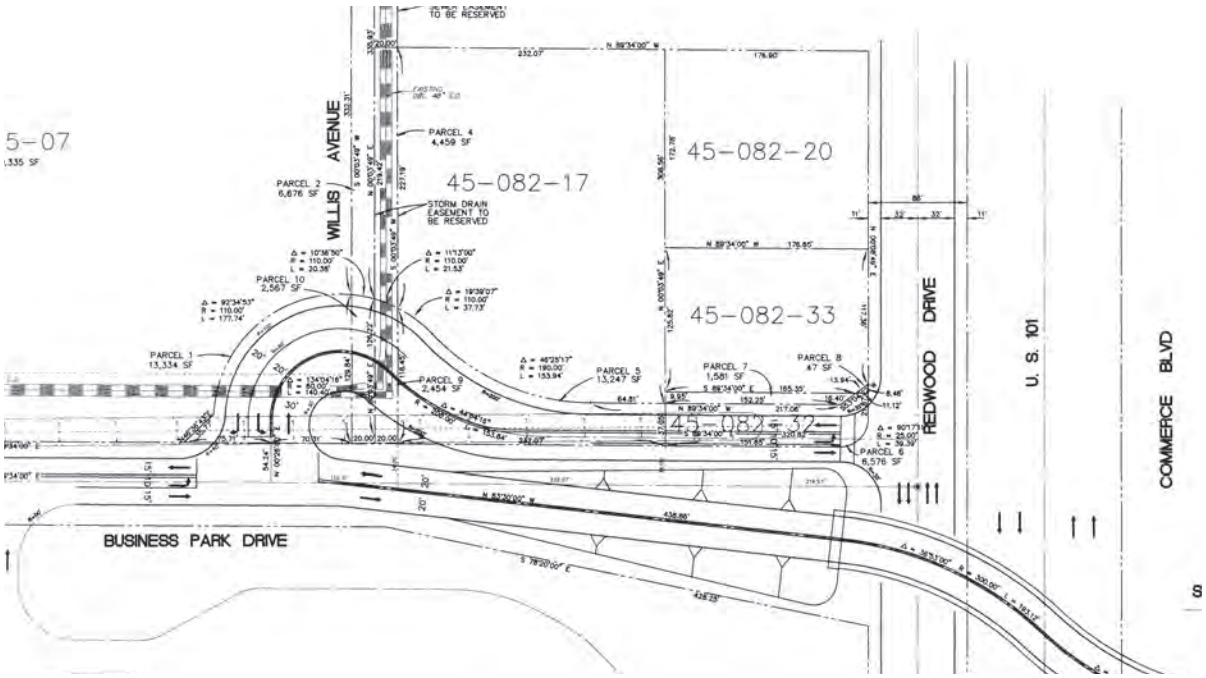
A crossing at this location could serve future west side mixed-use and employment centers planned in the Rohnert Park General Plan, 2019 update, for the Northwest Specific Plan and Wilfred-Dowdell Specific Plan areas. A crossing would also serve future development planned by the Federated Indians of Graton Rancheria (FIGR) adjacent to Graton Resort. These future residents could use the BPOC to cross US 101, and then travel north on Commerce Boulevard and east on Golf Course Drive, to reach the SMART multiuse pathway. A crossing could also provide access to the offices and Kaiser Permanente Medical Center adjacent to State Farm Drive.

On the east side, there are no crossings of the SMART railroad between Golf Course Drive and Rohnert Park Expressway. Therefore, a crossing at this location would primarily serve the existing industrial and office areas and allow workers to access the west side's fast food restaurants and Graton Resort.

North-south bicycle and pedestrian connections in this area include the northbound and southbound Class II bike lanes on Redwood Drive and the northbound Class II bike lane on Commerce Boulevard. A Class I pathway is also located along Commerce Boulevard, adjacent to US 101. East-west bicycle and pedestrian connections include the Class III bike routes along Business Park Drive and State Farm Drive.

Plans for a vehicular overpass connecting Business Park Drive and State Farm Drive were developed for the City in 1991 by M. Hudis and Associates, and public right-of-way has already been secured for the approaches. The proposed vehicular overpass is also included in the Rohnert Park General Plan, 2019 update, as a "priority project." When implemented, current codes and best practices would ensure that the new vehicular overpass includes safe and accessible bicycle and pedestrian facilities; therefore, this location was eliminated from further study for a new non-vehicular overcrossing.





Top left: Conceptual plan for a shared vehicular and pedestrian overpass (SGA, 2020)

Bottom left: Original west side plan for a new vehicular overpass (Rohnert Park, 1992)

Above: Conceptual plans for separated vehicular and bike/ped overcrossings (SGA, 2020)

4.3. INDUSTRIAL PARK AREA

The Industrial Park crossing location is situated approximately 0.75 mile south of the existing Golf Course Drive underpass and 0.25 mile north of the existing Rohnert Park Expressway overpass.

On both sides of US 101 in this location, the area is built out with primarily industrial businesses and single or double-story offices. Key destinations in this area include Costco Wholesale to the southwest and Kaiser Permanente Medical Center to the east.

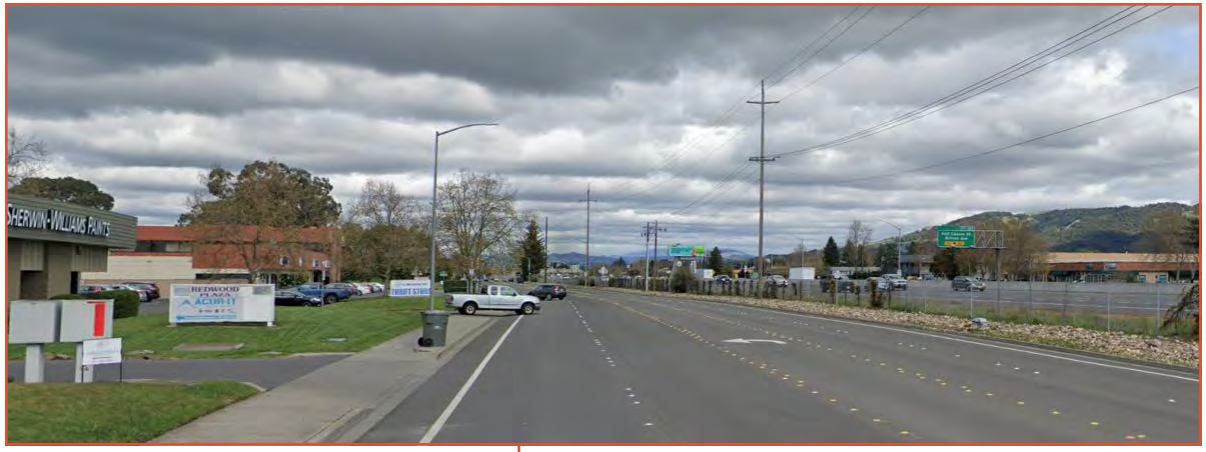
Although new residential communities have recently been constructed along Dowdell Avenue on the west side, there are no east-west connections between Dowdell Avenue and Redwood Drive that would allow these residents to access a bicycle and pedestrian crossing at this location.

On the east side, there is no crossing of the SMART railroad for approximately 1 mile between Golf Course Drive and Rohnert Park Expressway. Therefore, a crossing at this location would primarily allow the existing industrial and office areas to access other industrial business on the west side of US 101, as well as Costco.

For cyclists and pedestrians, this location includes strong north-south bike/ped connections, such as the northbound and southbound Class II bike lanes on Redwood Drive, the northbound Class II bike lane on Commerce Boulevard, and the Class I pathway located along Commerce Boulevard, adjacent to US 101.

However, east-west bike/ped connections are poor, since there are no crosswalks on Redwood Drive for one mile between Golf Course Drive and Martin Avenue on the west side of US 101. Additionally, on the east side of US 101, there are no crosswalks on Commerce Boulevard for 0.5 mile between State Farm Drive and Professional Center Drive. Thus, access between the Class I pathway adjacent to Commerce, and destinations further east, is unsafe or circuitous. Although Professional Center Drive on the east side provides a pedestrian connection via a sidewalk on one side between Commerce Drive and State Farm Drive, the street is not currently marked for cyclists, and the route requires backtracking.

A crossing in the Industrial Park location does not facilitate connections to east-west bike/ped routes, does not connect directly to pedestrian access across the frontage roads, and is in close proximity to the proposed US 101 overcrossing at State Farm Drive. Therefore, this location was eliminated from further study for a new crossing.



Top: Street view on Redwood Dr showing lack of crosswalks for one mile between Golf Course Dr and Martin Ave (Google, 2021)

Center: Inset map of Industrial Park area, with solid green lines indicating existing bike/ped facilities (SGA, 2020)

Bottom: Street view on Commerce Boulevard showing lack of crosswalks for 0.5 mile between State Farm Dr and Professional Center Dr (Google, 2021)

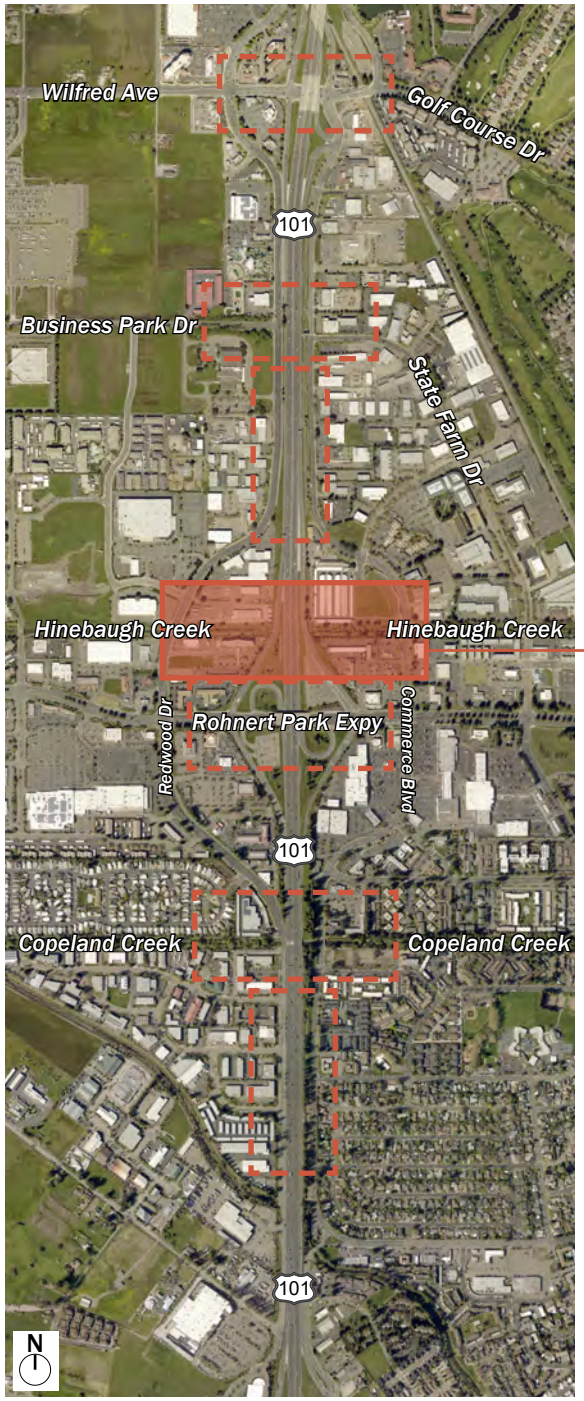
4.4. HINEBAUGH CREEK

Hinebaugh Creek is located approximately 700 feet north of the existing Rohnert Park Expressway overpass, along existing and proposed Class I paths that parallel the creek (Hinebaugh Creek Trail). Under US 101, a four-barreled box culvert conveys water from east to west. Each barrel is approximately 310 feet long, 11 feet wide, and 10.5 feet high.

The culvert is currently used by some community members as an unofficial crossing of the freeway, and a crossing of US 101 at this location is included in the SCTA Bicycle and Pedestrian Master Plan, 2014 update, as a “low” priority project. However, additional enhancements and connections along the creek paths are listed as “medium” and “high” priority projects.

Centrally located near the City’s primary commercial district, a US 101 crossing at Hinebaugh Creek would connect to many destinations and facilitate both east-west travel along the creek trail, as well as north-south travel along Redwood Drive and Commerce Boulevard. The creek trail would also connect to the SMART multiuse pathway, if a future crossing of the railroad is developed.

Given that a new crossing at Hinebaugh Creek would provide a variety of connectivity benefits, this location was selected for further study.



Top: View under US 101, inside the existing Hinebaugh Creek culvert, which is frequently wet from natural flow and surface runoff (SGA, 2020)

Center: Inset of map of Hinebaugh Creek area, with solid green lines indicating existing bike/ped facilities, and dashed lines indicating potential future facilities (SGA, 2020)

Bottom left: There is no existing crosswalk on Redwood Dr at Hinebaugh Creek, so cyclists and pedestrians have to cross at the Martin Ave intersection, 200 feet to the north (SGA, 2020)

Bottom right: Existing crosswalk on Commerce Blvd at Hinebaugh Creek (SGA, 2020)

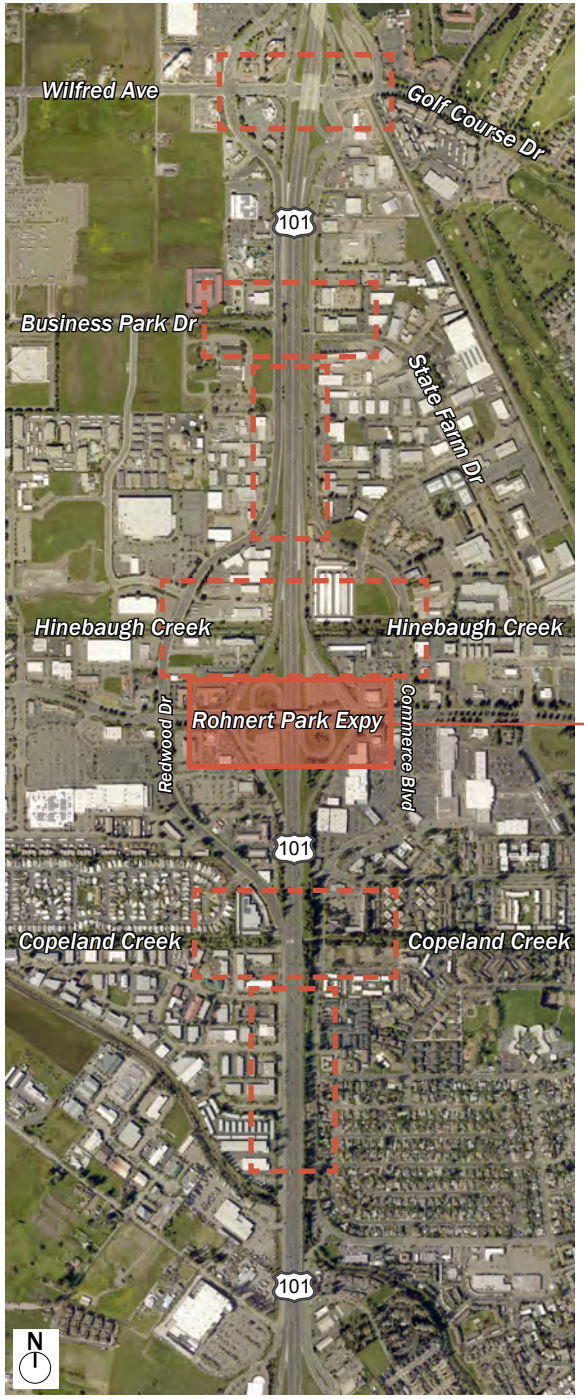
4.5. ROHNERT PARK EXPRESSWAY

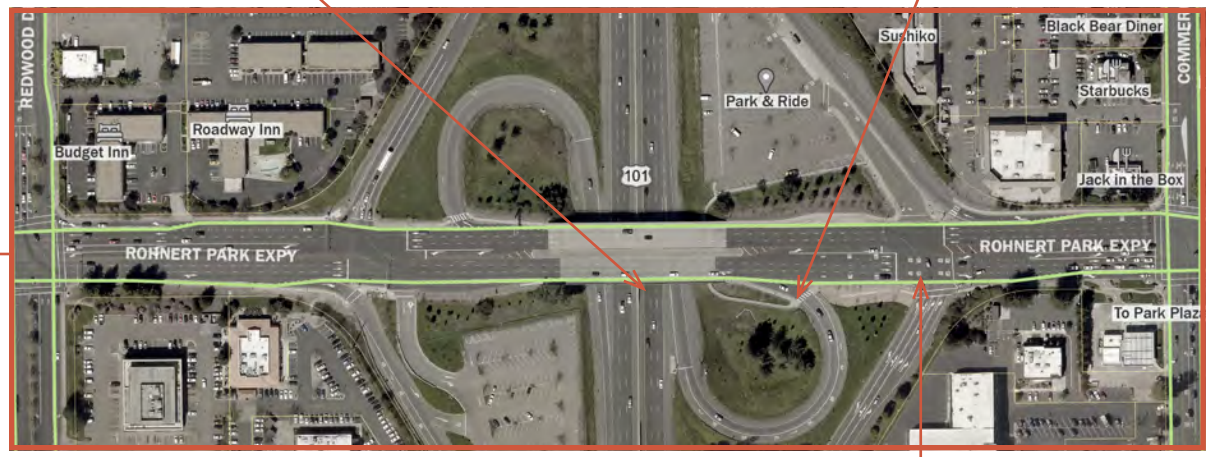
In central Rohnert Park, Rohnert Park Expressway is a major east-west thoroughfare that allows community members to access US 101, cross between the east and west sides of the City, and cross the SMART right-of-way. The Expressway is approximately 100 feet wide, with eight lanes of traffic, a posted speed limit of 40 mph, and serves approximately 46,000 vehicles per day.

The bike/ped facilities on the Expressway consist of sidewalks and bike lanes that are 5 feet wide and unbuffered from vehicles. Both cyclists and pedestrians must cross with vehicles that turn right to enter and exit the freeway ramps, enter and exit the Golden Gate Transit park-and-ride lots, or onto the Redwood Drive and Commerce Boulevard frontage roads.

In the study area, the only crosswalks across the Expressway are located 0.4 mile apart, at Redwood Drive and Commerce Boulevard. This is particularly inconvenient for users of the park-and-ride lots, since buses will pick up and drop off riders on opposite sides of the Expressway. Although there is a pedestrian pathway that crosses under Rohnert Park Expressway on the east side of US 101, which connects the north park-and-ride-lot to the sidewalk on the south side of the Expressway, cyclists and pedestrians occasionally cross the Expressway near the center of the overpass instead, using the raised center median as a refuge island. According to City staff, the connection under the Expressway is poorly lit at night, feels unsafe, and is infrequently used by regular commuters.

The Expressway overpass area has heavy vehicular traffic, many intersections and conflict points, and a history of collisions, creating a high-stress environment with a high risk to bike/ped safety. Although incremental improvements could be made within the existing overpass area to better facilitate safer and more inviting bicycle and pedestrian travel, it is not feasible to change the inherent nature of the vehicle-dominated intersections. Therefore, this location was eliminated from the study for a new bike/ped overcrossing of US 101.





Top left: Existing bike/ped facilities on the Rohnert Park Expy overpass consist of unprotected bike lanes adjacent to cars and large trucks, and a 5-foot-wide sidewalk (Google, 2020)

Center: Inset map of Industrial Park Expy area, with solid green lines indicating existing bike/ped facilities (SGA, 2020)

Top right: Cyclists and pedestrians using the Rohnert Park Expy overpass on must cross freeway on-ramps and fast-moving cars (SGA, 2020)

Bottom: Cyclists and pedestrians using Rohnert Park Expy overpass must navigate freeway off-ramps, large intersections, and turning vehicles (Google, 2022)

4.6. COPELAND CREEK

Copeland Creek is situated approximately 0.35 miles south of the existing US 101 overpass at Rohnert Park Expressway, and class I paths parallel the creek (Copeland Creek Trail). Under US 101, a two-barreled box culvert conveys water from east to west. Each barrel is approximately 175 feet long and 14.5 feet wide. Unlike the culvert at Hinebaugh Creek, which has a flat bottom, the barrels of the Copeland Creek culvert have a center channel. Raised portions approximately 3 feet wide and 2 feet wide on either side of the channel may give the impression that pedestrian use is intended. The height between the "sidewalks" and soffit is approximately 8.5 feet.

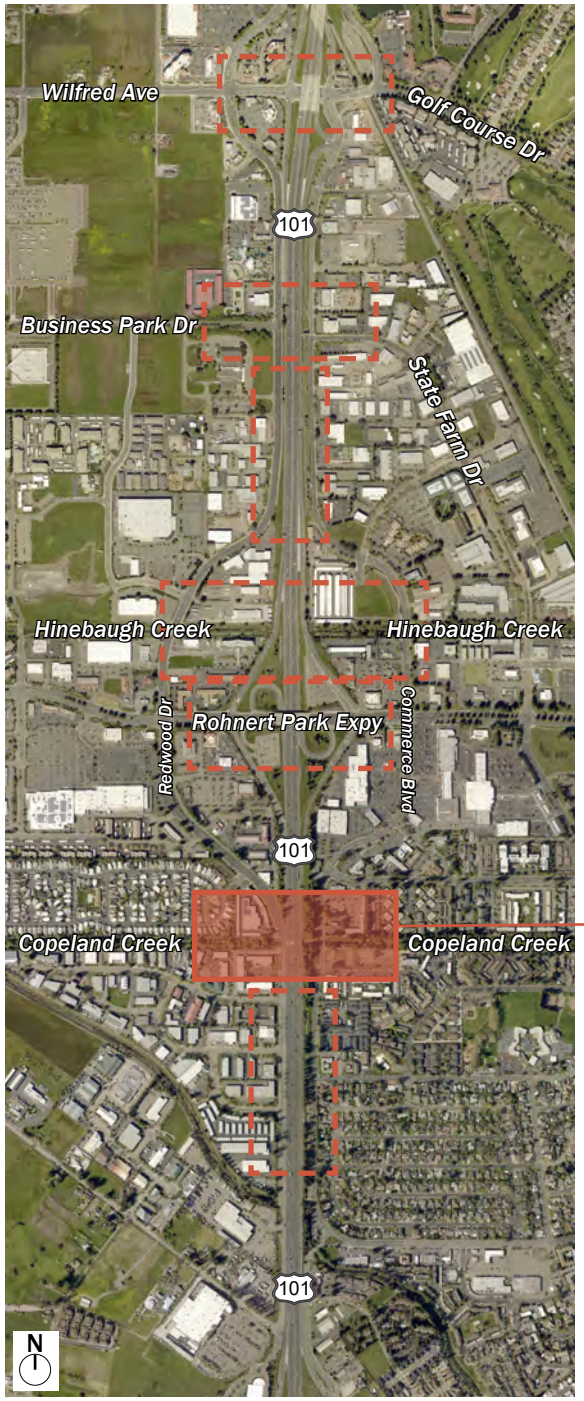
Centrally located, a new US 101 bike/ped crossing at this location would connect to many destinations, including the City's primary commercial district and the residential areas located to the south and east. On the east side of US 101, a new crossing would directly serve the high-density multi-family housing and senior communities adjacent to the creek, including the 90-unit Bella Creek multi-family residential project currently under construction. On the west side, the crossing would directly serve the Rancho Feliz Mobile Home Park and the multi-family apartment units along Laguna Drive.

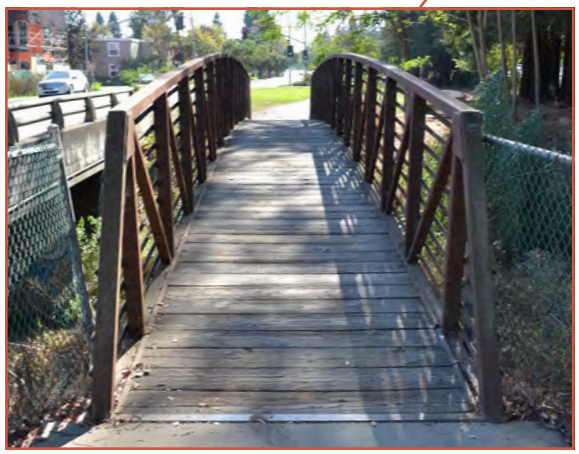
As part of the system of east-west Class I paths that parallel the City's creeks, the Copeland Creek Trail is continuously paved and serves as key east-west route in the active transportation network. On the east side of US 101, the Copeland Creek Trail includes several pedestrian bridges over the creek that connect the pathways along the creek's the north and south sides.

At the SMART right-of-way, Copeland Creek Trail includes existing railroad crossings on both sides of the creek that allow cyclists and pedestrians to access the SMART pathway for north-south travel, as well as Sonoma State University at the eastern edge of the City. Immediately east of US 101, the Copeland Creek Trail intersects with the north-south Commerce Boulevard Class I Path that connects to the Southwest Boulevard neighborhood commercial area, the City's southern residential districts, as well as downtown Cotati.

On the west side of US 101, Copeland Creek Trail is paved on the northern Rohnert Park side of the creek, but unpaved on the southern Cotati side. Although there are no existing crossings of the creek between the two cities, the SCTA Bicycle and Pedestrian Master Plan identifies a bridge crossing Copeland Creek on the west side as a "high" priority project but states its location as "to be determined."

As at Hinebaugh Creek, the Copeland Creek culvert is also currently used as an unofficial crossing of US 101 but appears to be more well-used than Hinebaugh Creek. Therefore, an east-west connection in this location is already known, and the Rohnert Park General Plan identifies this location for an undercrossing, with additional enhancements such as lighting and trash receptacles. Similarly, the SCTA Bicycle and Pedestrian Master Plan identifies a crossing at this location as a "high" priority project, but calls for an overcrossing instead. Given that a new crossing at Copeland Creek would provide a variety of connectivity benefits, this location was selected for further study.





Top left: View west along the existing Copeland Creek Trail near Redwood Dr (SGA, 2020)

Top right: View under US 101, inside the existing Copeland Creek culvert, which is currently used to informally cross under the freeway (SGA, 2020)

Center: Inset of map of Copeland Creek area, with solid green lines indicating existing bike/ped facilities (SGA, 2020)

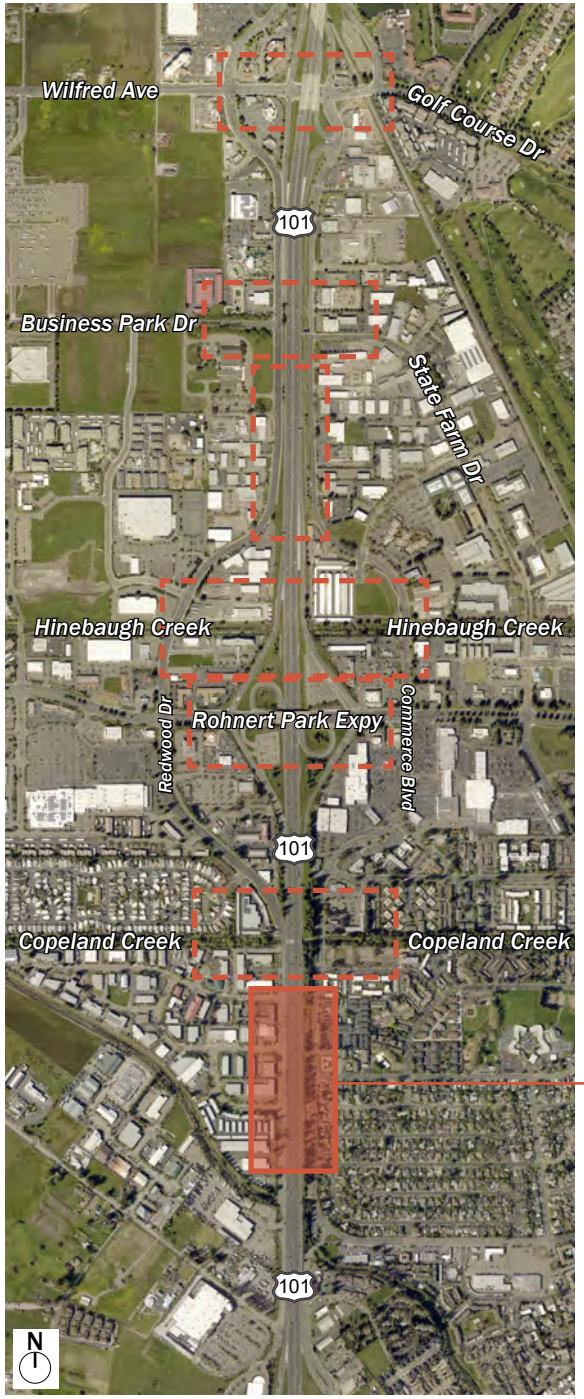
Bottom left: Existing 5-foot-wide footbridge over Copeland Creek at Commerce Blvd (SGA, 2020)

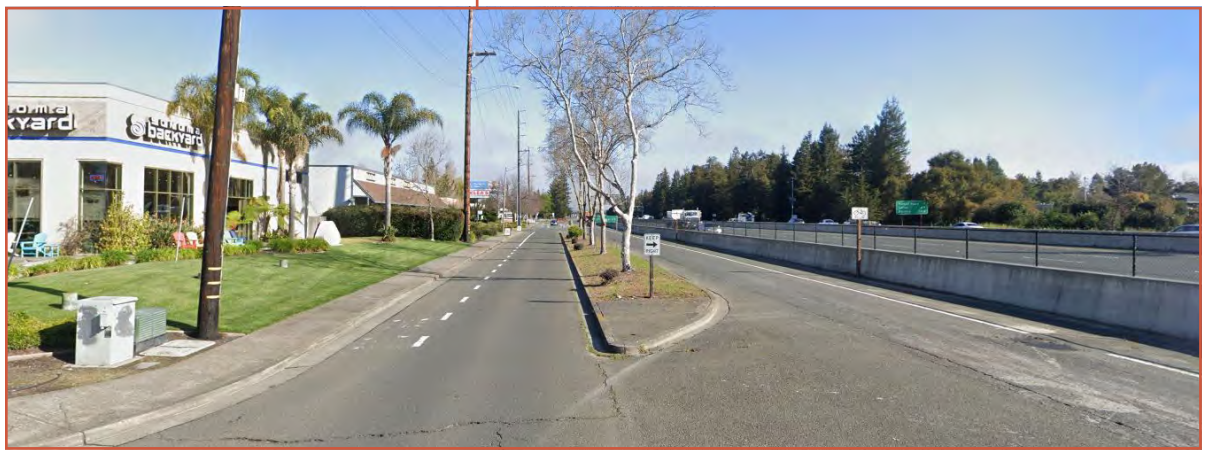
Bottom right: Aerial view looking south over Commerce Blvd and the north-south Class I Path and the Bella Creek multi-family residential project (SGA, 2021)

4.7. COTATI / A-SECTION

The Cotati and A-Section crossing location is situated approximately 0.25 mile south of Copeland Creek and 0.5 mile south of the existing Rohnert Park Expressway overpass. The development of a new crossing in this location would require the cooperation the City of Cotati on the west side.

Since east-west routes are limited in this area, a new crossing would primarily facilitate north-south travel along Redwood Drive and the Class I path adjacent to Commerce Boulevard, and serve the industrial area of Cotati. On the east side, a crossing would serve the residents in A-Section, and connections to streets such as Arlen Drive and Southwest Boulevard allow bike/ped travel to the residential areas further east. However, these routes are circuitous, along high-stress streets with a posted speed limit of 35 mph, and bring travelers back north towards Copeland Creek to cross the SMART railroad. For these reasons, this location was eliminated from further study for a new bike/ped crossing.





Top: Aerial view looking southwest over the industrial area of Cotati on the west side of US 101 (SGA, 2021)

Center: Inset of map of the Cotati/A-Section area, with solid green lines indicating existing bike/ped facilities, and dashed lines indicating potential future facilities (SGA, 2020)

Bottom: To accommodate the approach for an overcrossing in this area, the landscaped median on Redwood Dr would need to be removed and the roadway would need to be reconfigured (Google, 2021)

A cyclist rides along the paved Copeland Creek Trail (SGA, 2020)

4.8. LOCATIONS ASSESSMENT SUMMARY

Both the Hinebaugh Creek and Copeland Creek locations were selected for further study of a new bike/ped crossing of US 101 because the creeks run east-west through central Rohnert Park, are centrally located adjacent to community-identified destinations, and include well-used bike/ped trails for active transportation and recreation. The existing US 101 crossing locations at Golf Course Drive and Rohnert Park Expressway were eliminated from further study because is not feasible to remove the risks to bike/ped safety inherent in the existing automobile-centric intersections. The Business Park Drive and State Farm Drive location was also eliminated because the City has planned for a new vehicular overcrossing of US 101 at the location which would include bike/ped facilities. Lastly, the Industrial Park and Cotati / A-Section locations were eliminated from further study because they do not facilitate east-west travel or access to community-identified destinations better than adjacent potential crossing locations.

5. DETAILED ASSESSMENT OF CREEK LOCATIONS

5.1. FUTURE DEMAND AND ACCESSIBILITY

5.2. ENVIRONMENTAL

5.3. RIGHT OF WAY

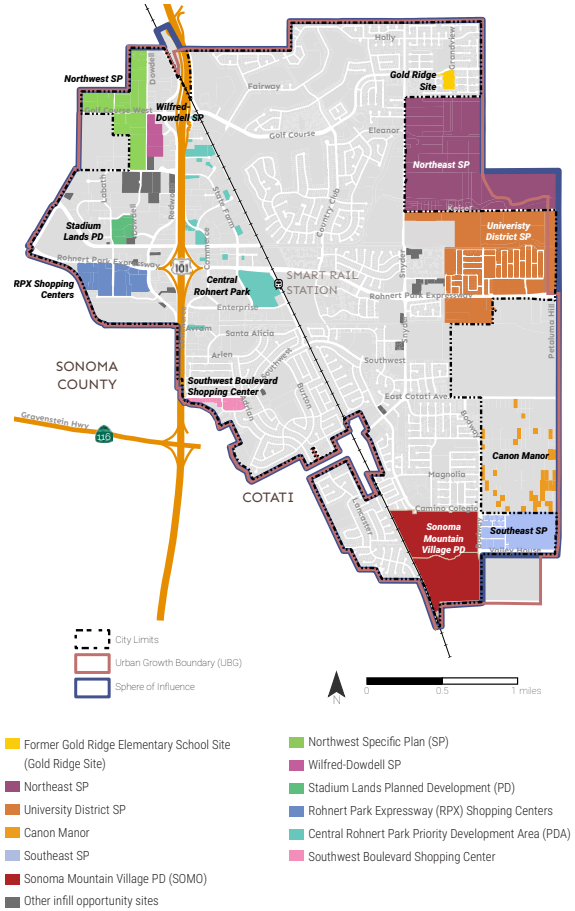
5.4. UTILITIES

5.5. GEOMETRICS

5.6. HYDRAULICS

5.7. CREEK ASSESSMENT SUMMARY

5. DETAILED ASSESSMENT OF CREEK LOCATIONS



Geographic focus areas with anticipated development potential (Rohnert Park, 2019)

5.1. FUTURE DEMAND AND ACCESSIBILITY

Travel demand and accessibility between households, jobs, and key destinations will change with a new crossing at either Hinebaugh Creek or Copeland Creek. Changes were assessed assuming implementation of the currently proposed Rohnert Park General Plan Update (GPU). The destinations assessed reflect "Geographic Focus Areas" that were identified as part of the ongoing GPU process in the proximity of the two crossing locations:

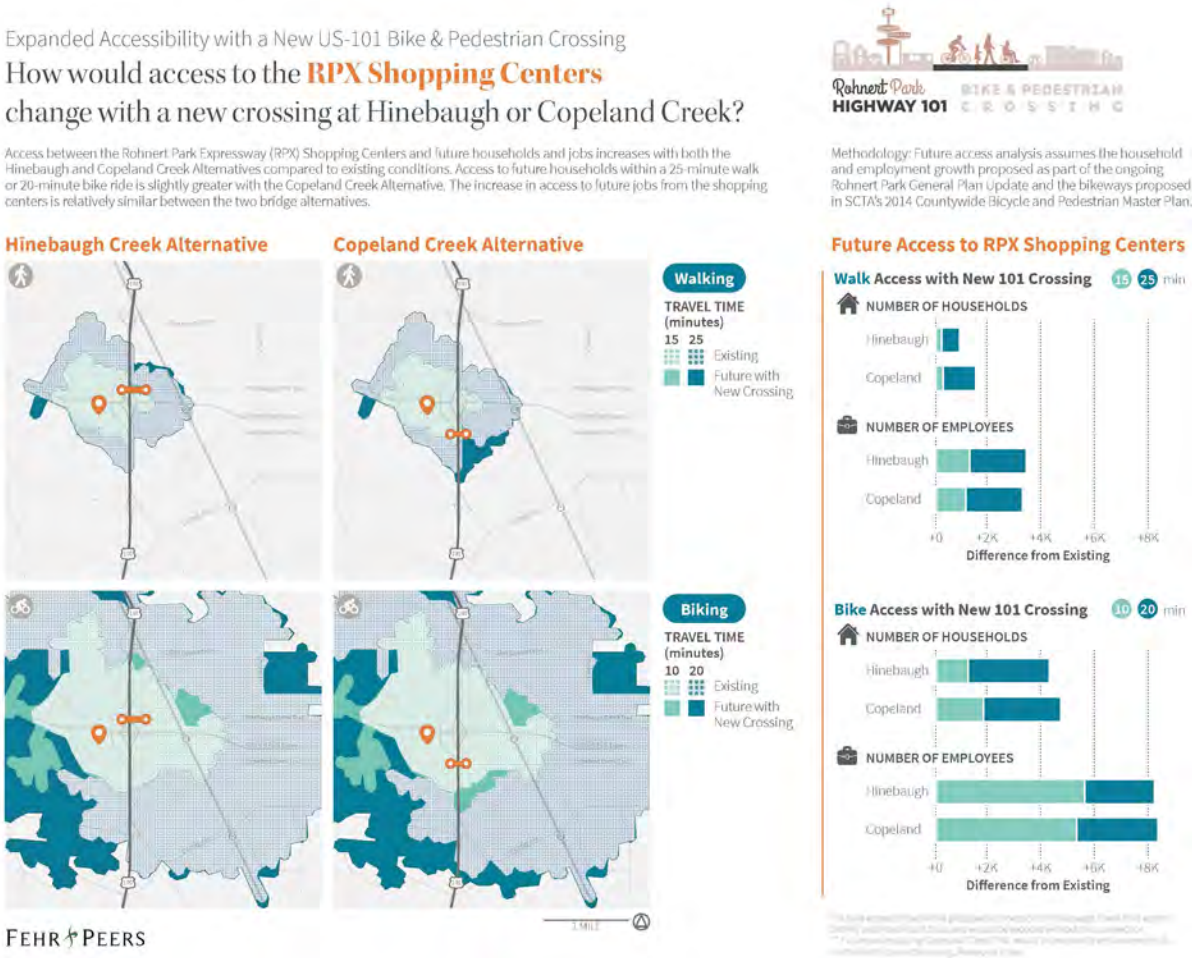
1. Stadium Lands Planned Development
2. Rohnert Park Expressway (RPX) Shopping Centers
3. Rohnert Park SMART Station & Central Rohnert Park

Using data for existing and proposed bike/ped routes, accessibility analyses were performed for both creek locations. The access sheds for specific walking and biking times (between 10 and 25 minutes) were compared to existing and future household and employment data to estimate the number of households and jobs accessible within certain travel time sheds under existing and future conditions. See Appendix B for full assessment.

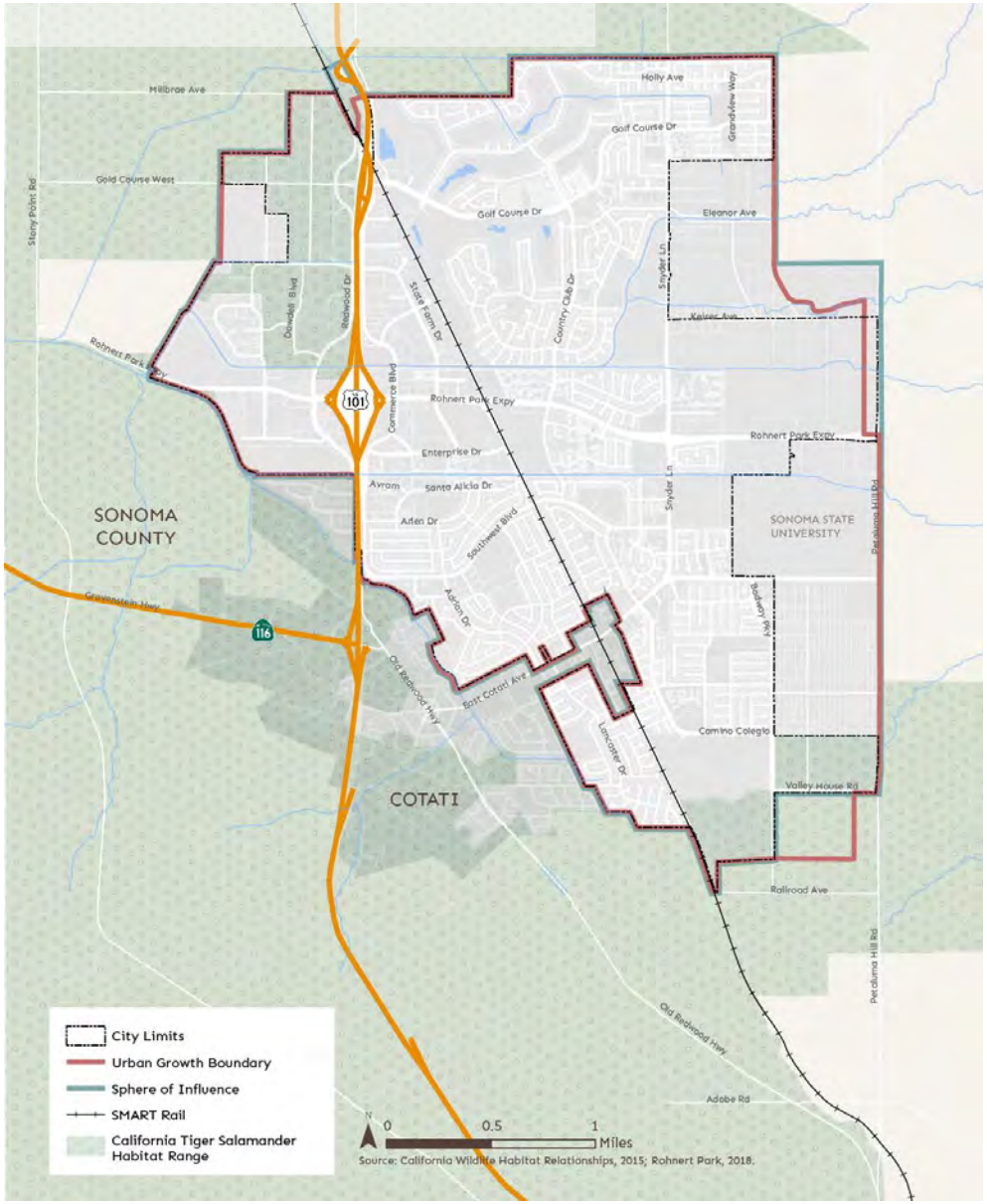
Overall findings include:

1. Future access between households, jobs, and key destinations increases to a similar degree with a new crossing located at either the Hinebaugh Creek or Copeland Creek locations, compared to existing conditions.
2. Future access estimates for Hinebaugh Creek rely on a new bike/ped connection across the SMART railroad and the Foxtail Golf Club. Although this connection is included in the SCTA Bike/Ped Master Plan, developing this connection would be very challenging since it requires crossing golf course fairways (e.g., an at-grade crossing would need a level crossing at the railroad and protection from golf balls, while an overcrossing would need to provide vertical clearance for golf carts).
3. Since there is no official crossing of the railroad for approximately 1 mile between Golf Course Drive and Rohnert Park Expressway, access to a crossing at Hinebaugh Creek would be reduced significantly without a new golf course crossing.
4. Since the primary crossing of the SMART railroad in the Hinebaugh Creek area is currently located at Rohnert Park Expressway, cyclists and pedestrians traveling from the residential neighborhoods to the east and south must pass through the intersections of Rohnert Park Expressway with State Farm Drive or Commerce Drive.
5. Based on data recorded from 2008 to 2019 by the Transportation Injury Mapping System, these two intersections have had a history of bicycle and pedestrian collisions, with ten at Commerce Drive and four at State Farm Drive. Developing a new non-vehicular crossing of US 101 at Hinebaugh Creek would attract more cyclists and pedestrians into a more dangerous vehicle-centric area.

6. The Copeland Creek Trail crosses the entire city and connects with a trail through A and B Sections, to provide access to residents in southeast Rohnert Park. Therefore, the Copeland Creek Trail generally provides greater connectivity than the Hinebaugh Creek Trail, which is currently interrupted at SMART and the golf course.
7. Prioritizing the Copeland Creek Trail crossing would improve equity outcomes since it more directly serves Sections A, B, and C, including the Rancho Feliz and Rancho Verde mobile home parks.
8. Future access along the Copeland Creek Trail could be improved with minor enhancements, such as implementing "low-stress" walking and biking facilities on Redwood Drive or improving trail connections to the RPX Shopping Centers near Laguna Drive.



Assessment of existing and future bike/ped accessibility to Rohnert Park Expressway Shopping Centers if a new crossing of US 101 were constructed (Fehr & Peers, 2020)



Map of California Tiger Salamander habitat range (Rohnert Park General Plan Update Land Use and Community Character Whitepaper, 2019)

5.2. ENVIRONMENTAL

Based on the site conditions at the creek locations, this Study anticipates that technical studies required for the project include Phase I and Phase II Environmental Site Assessments, a Natural Environment Study, a Section 4(f) evaluation, a Visual Impact Assessment, a Noise Study, and an Archaeological Survey Report. Since this project is located at the creeks, and would impact waters of the US, compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) would be required. Under CEQA, an appropriate environmental document for the project would be an Initial Study, most likely leading to a Mitigated Negative Declaration (IS/MND). Under NEPA, Caltrans would be the Federal Lead Agency, and this project would likely fall under the Federal Highway Administration's Categorical Exclusion 23 CFR 771 (c)(3), since its activities pertain to the construction of bicycle and pedestrian lanes, paths, and facilities.

Cultural and Paleontological Resources

The City is located in an area which was inhabited by the Coast Miwok indigenous people prior to contact and settlement by Europeans. According to the City's General Plan, Native American archaeological sites have been identified on alluvial plains, and at the base of the hills on the east side of the City that was once located adjacent to a historic marsh. However, no archaeological sites have been recorded on the west side, which was once located within the marsh and therefore has a lower possibility of identification of unrecorded cultural resources.

Biological Resources

Although Hinebaugh Creek and Copeland Creek have been channelized in central Rohnert Park, the creeks are areas with a high potential for wetlands, vernal pools, and special plant and animal habitats. The creek corridors near the eastern edge of the City, which have a high potential to sustain several species of riparian vegetation, including native California blackberry, wild grape, and wild rose, also have a high potential to provide habitat for wildlife. Copeland Creek, for example, is a steelhead-bearing stream with significant habitat and ecological value, particularly where it consists of a semi-natural channel within the Sonoma State University campus. However, central Rohnert Park generally provides low habitat value since it is heavily urbanized and subject to regular human disturbance. According to the General Plans for Rohnert Park and Cotati, the species of concern that may be found around the creeks are the Northwestern Pond Turtle, California Tiger Salamander, and Saline Clover.

Fish and Game Code section 1602 requires any person, state or local governmental agency, or public utility to notify the California Department of Fish and Wildlife (CDFW) prior to beginning any activity that may do one or more of the following to any river, stream, or lake, including those that are dry for periods of time as well as those that flow year round:

1. Divert or obstruct the natural flow;
2. Change the bed, channel, or bank;
3. Use material from the waterway; or
4. Deposit or dispose of material into the waterway.

The CDFW requires a Lake and Streambed Alteration (LSA) Agreement when a project activity may substantially adversely affect fish and wildlife resources.

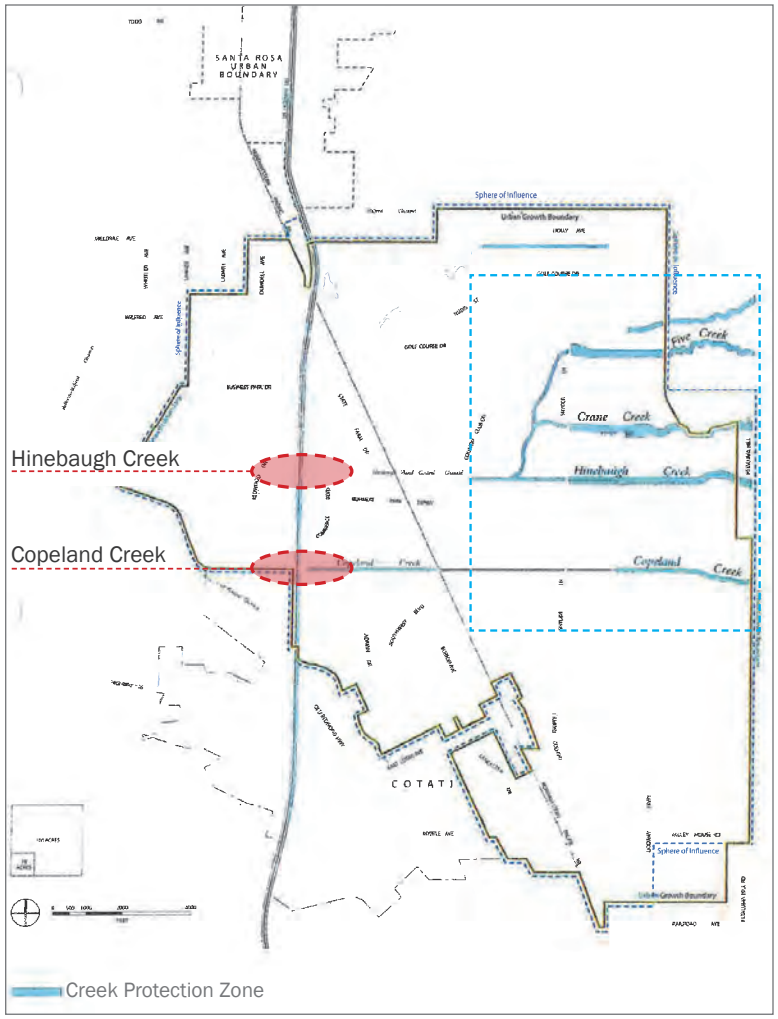
Water Quality

In central Rohnert Park, both Hinebaugh Creek and Copeland Creek have been improved or diverted to improved channels or ditches to convey the 1% annual chance flood to the Laguna de Santa Rosa, whose waters reach the Russian River. Construction at either creek location would generate a disturbed soil area (DSA) of less than one acre and impact waters of the US.

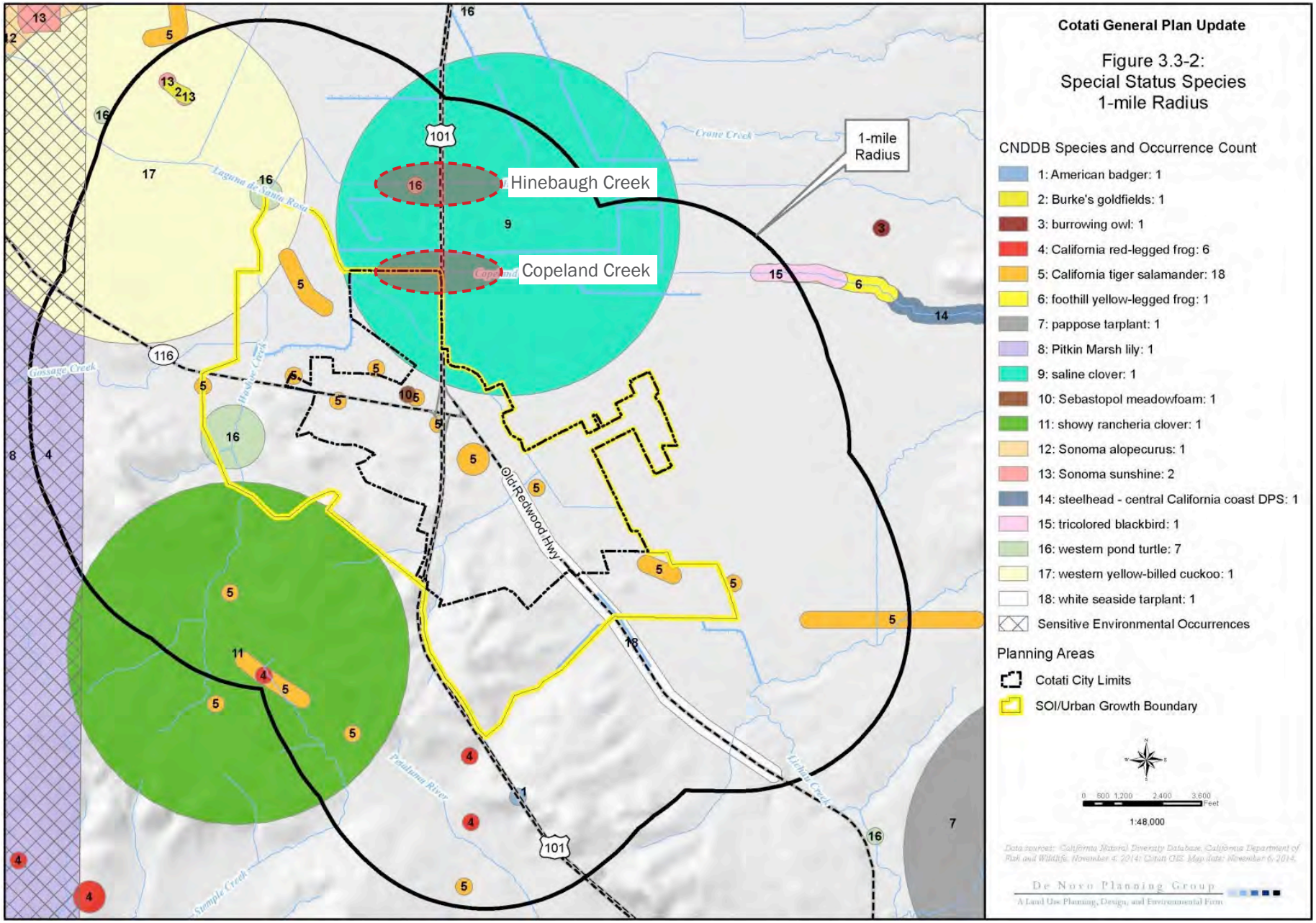
The Clean Water Act (CWA) established the National Pollution Discharge Elimination System (NPDES) program to control the discharge of pollutants through implementation of water quality standards and federal technology-based standards and requirements in a permitting system. These NPDES permits protect receiving waters from the discharge of toxic material in toxic amounts.

Per Section 404 of the CWA, the US Army Corps of Engineers (Corps) regulates the discharge of dredged and/or fill material in waters of the US. Under Section 10 of the Rivers and Harbors Act of 1899, the Corps regulates work in navigable waters of the US. The Corps jurisdiction for waters of the US is based on the definitions and limits of jurisdiction contained in 33 CFR 328, which identifies navigable waters, their tributaries, and adjacent wetlands as, in part, waters of the US. Some examples of jurisdictional waters may include ephemeral, intermittent, and perennial streams, wetlands, lakes, and ponds. The term fill material means material placed in waters of the US, where the material has the effect of replacing any portion of a water of the US with dry land or changing the bottom elevation of any portion of a water. Therefore, projects involving the discharge of dredged and/or fill material into waters of the US require authorization from the Corps.

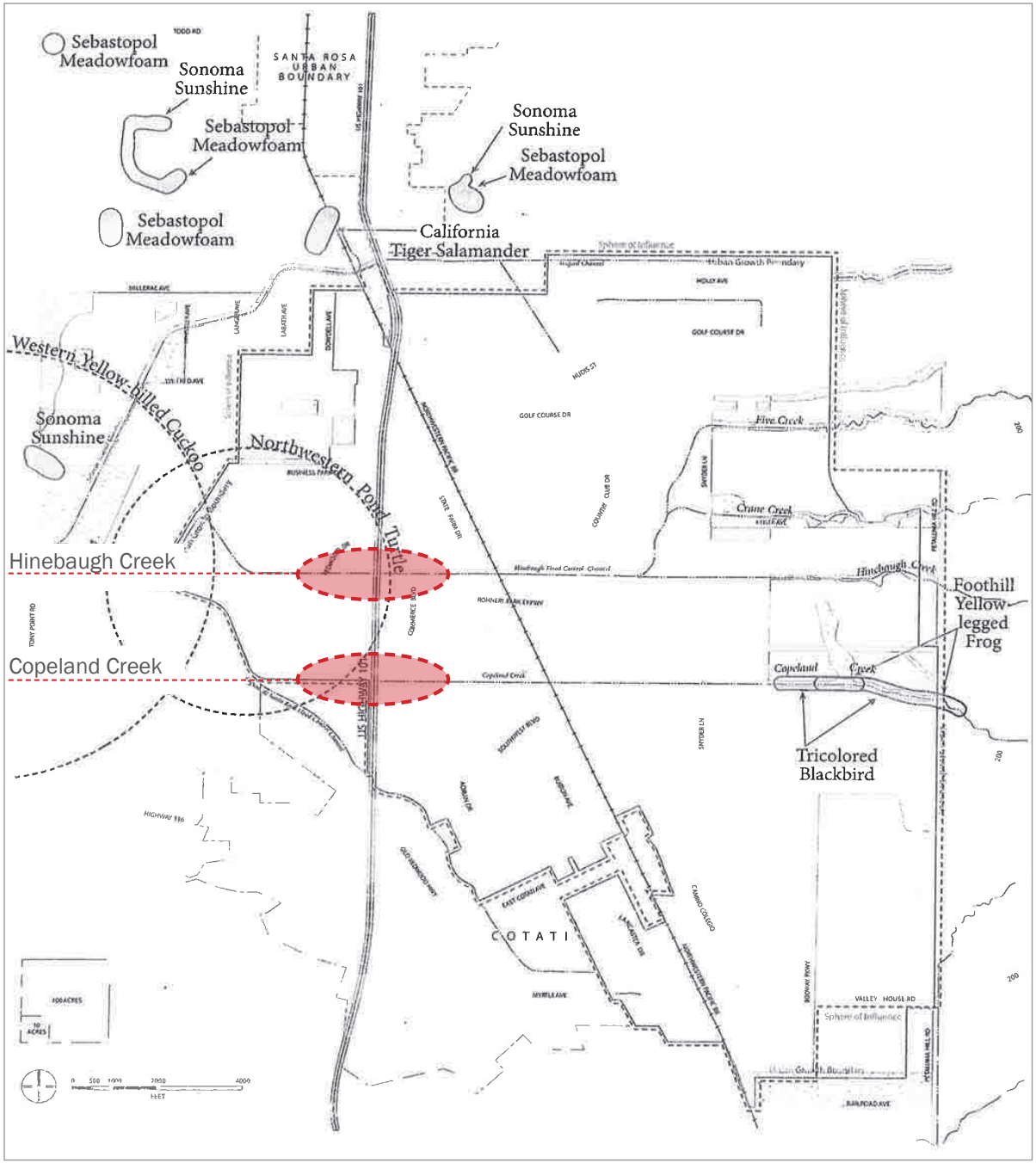
Section 401 of the CWA requires that any applicant for a Section 404 permit also obtain a Water Quality Certification from the State Water Resources Control Board (SWRCB). The SWRCB, acting through the Regional Water Resources Control Board, must certify that a Corps permit action will be in compliance with the State's applicable water quality standards.



Map of Creek Protection Zones (Rohnert Park General Plan, 2000)



Map of California Natural Diversity Database's species occurrences and locations, including species occurrences around Hinebaugh Creek and Copeland Creek (Cotati General Plan Update EIR, 2011)



Map of Habitat Areas and Special Status Species (Rohnert Park General Plan, 2000)

Scenic Resources and Visual Access

In Rohnert Park, existing bike/ped paths allow the community to enjoy the creeks' natural aesthetic qualities and scenic view corridors. Both Hinebaugh Creek and Copeland Creek are lined by trees, and from both locations, the ridgeline forms a prominent natural feature to the east. The two peaks visible are Taylor Mountain (1400 feet elevation) and Sonoma Mountain (2300 feet elevation). Additionally, Sonoma County has designated US 101 as a scenic view corridor and the stretch through Rohnert Park, south of Rohnert Park Expressway, is lined by redwood trees. Alignments for this project should be developed to avoid impacts to major trees.

On the south side of Hinebaugh Creek, a two-story motel is located on the east side of US 101, and a four-story hotel is located on the west side. A new overcrossing at this location may result in visual access issues if the alignment is located along the south side of the creek. Immediately adjacent to the south side of Copeland Creek, Bella Creek, a four-story multi-family residential complex is currently being constructed. A new overcrossing at this location may result in visual access issues if the alignment is located along the south side of the creek and spans Commerce Boulevard.

Along northbound and southbound US 101, two overhead freeway signs are located in the vicinity of Copeland Creek. In the northbound direction, an overhead sign at exit 483 to Rohnert Park Expressway is located approximately 470 feet north of the creek. In the southbound direction, an overhead sign notifying drivers of exit 481B to Route 116 west, Sebastopol, and Downtown Cotati, is located approximately 160 feet south of the creek. This sign is followed by an additional overhead sign at exit 481B, approximately 0.5 mile further south. Based on preliminary visual studies conducted as part of this Study, a overcrossing at Copeland Creek will not affect visual access to these overhead signs to an extent that requires relocation of the signs.

5.3. RIGHT OF WAY

Right of way at both creek locations that would be required to construct a new overcrossing using the alignments recommended in this Study are publicly owned. According to the Sonoma County Water Agency (Sonoma Water), Sonoma Water owns the Hinebaugh Creek and Copeland Creek properties on the west side of US 101, and the City owns the creek properties on the east side. While Sonoma Water has an easement with the City to maintain the creeks in City right-of-way on the east side, the City has an easement with the Agency to maintain the paved trails along in Sonoma Water's right-of-way on the west side. The culverts, freeway, and landscaped areas between the freeway's access control fences are State-owned, and the frontage roads are City-owned.

On the west side of US 101 at Copeland Creek, the City also owns a property that contains a billboard and a water well with a pneumatic water hammer, pressure tank, and pump house. The overcrossing designs recommended by this Study would not require these City facilities to be removed. However, according to City staff, the water hammer and pressure tank could be replaced with a variable frequency drive if necessary, at a cost of approximately $125,000, but the pump house would likely need to remain. The billboard, which provides some revenue to the City, could also be removed if necessary.

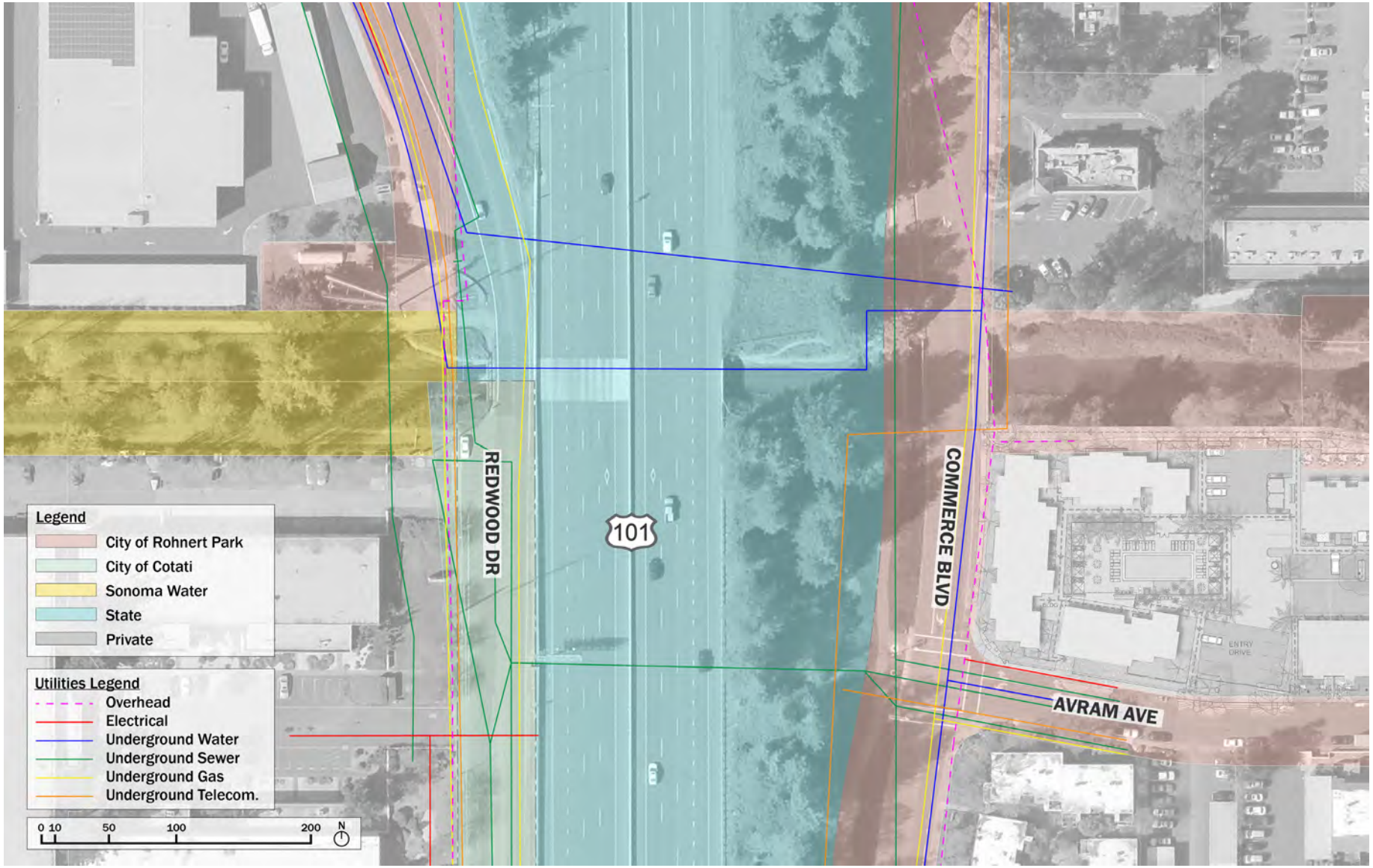
5.4. UTILITIES

Adequate clearance must be provided from electrical lines, or the wires would need to be relocated. On the west side of US 101, at both Hinebaugh Creek and Copeland Creek, overhead electrical wires run parallel to the west side of Redwood Drive. These wires consist of 115 kV transmission lines, 21 kV distribution lines, as well as communication lines and occasional service drops. At Hinebaugh Creek, the 21 kV distribution lines are lower than the lines at Copeland Creek by approximately 10 feet, and the communication lines are lower by approximately 20 feet. Relocation of these overhead wires would be required for any overcrossing at Hinebaugh Creek, but relocation of overhead utilities is unlikely to be required on the west side at Copeland Creek.

On the east side of US 101, no overhead utilities are located adjacent to the freeway at Hinebaugh Creek. However, at Copeland Creek, 115 kV transmission lines run parallel to the east side of Commerce Boulevard, south of Enterprise Drive, and would be impacted by any overcrossing that also spanned Commerce Boulevard.

At Hinebaugh Creek, underground utilities in the study area include a municipal water line that runs east-west along the north edge of the creek and a north-south sewer line located on the east side of US 101 near the freeway.

More underground utilities are located around Copeland Creek than at Hinebaugh Creek. These utilities include north-south municipal water and sewer lines, PG&E gas mains, and Comcast telecommunication cables and fiber optic lines on both sides of US 101. Located along the western edge of the Copeland Creek culvert at Redwood Drive, is a pipe for the air portion of the sewer line that passes under the creek.



Map of existing rights of way and utilities at Copeland Creek and US 101 (SGA, 2021)

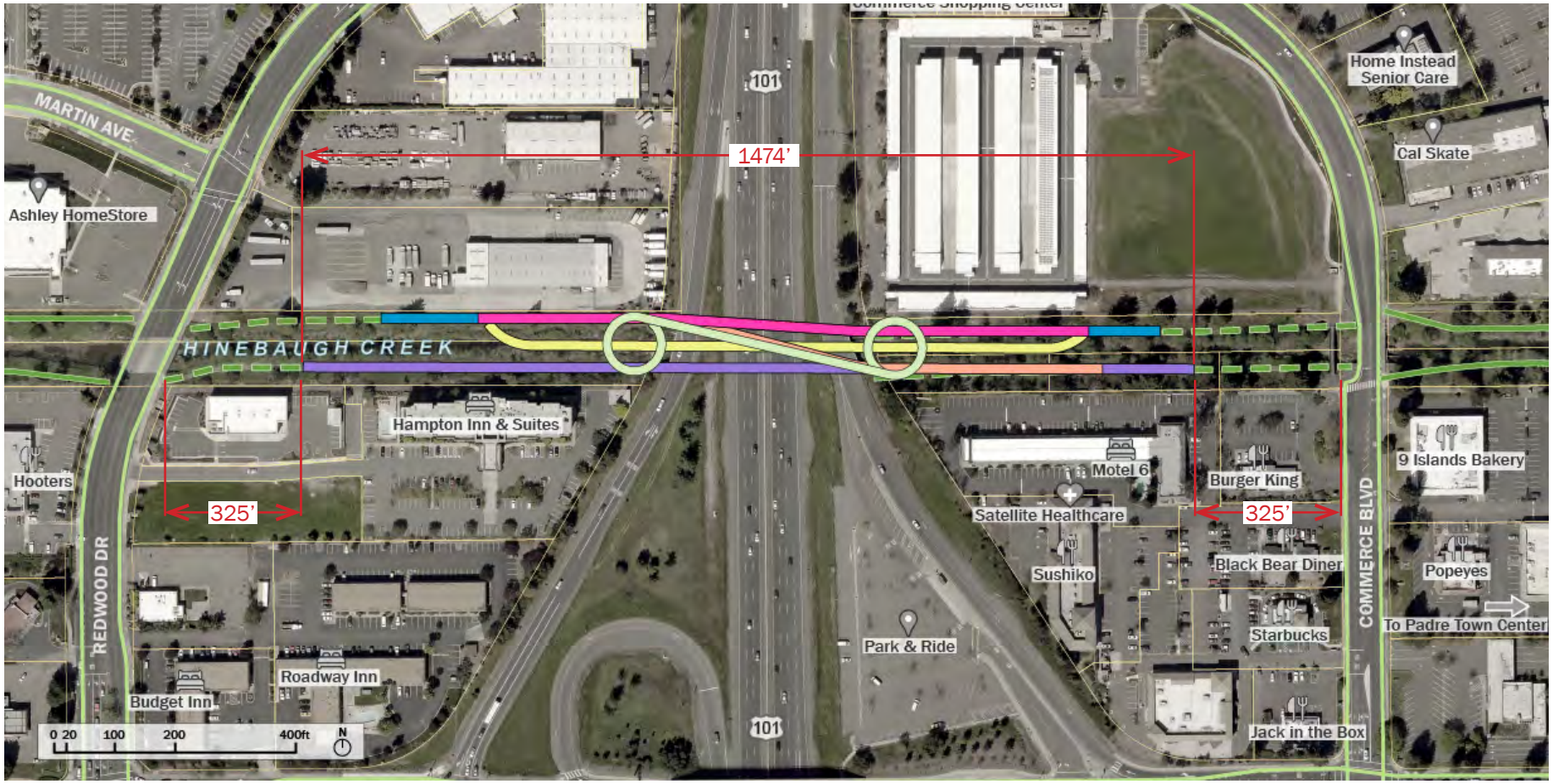
According to City staff, the City is already considering methods other than a siphon at this location, so the pipe can be moved or replaced. A municipal water line also runs east-west under the north edge of Copeland Creek. Among the abandoned underground utilities in the area, an abandoned PG&E gas main runs north-south along the center median of US 101. The design of a bike/ped crossing at either of the creek locations should avoid these utilities, or utility relocations would be required.

5.5. GEOMETRICS

Overcrossing

While ample space exists at both Hinebaugh Creek and Copeland Creek for a new overcrossing of US 101, geometric conditions at Copeland are more favorable. At Hinebaugh Creek, due to the elevation difference between the creek and freeway, as well as the vertical clearance requirements over the freeway and Sonoma Water's maintenance roads, a new east-west overcrossing would need to be approximately 221 feet longer than a crossing at Copeland. Moreover, since Redwood Drive and Commerce Boulevard are particularly far from US 101 at Hinebaugh, users of an overcrossing would have to travel an additional 325 feet beyond the bridge touchdowns to reach these frontage roads and access bike/ped connections. Because no crosswalk currently exists at Redwood Drive, users of the Hinebaugh Creek Trail who are traveling east-west must cross at the signalized intersection at Martin Avenue, which adds approximately 525 feet to the path of travel.

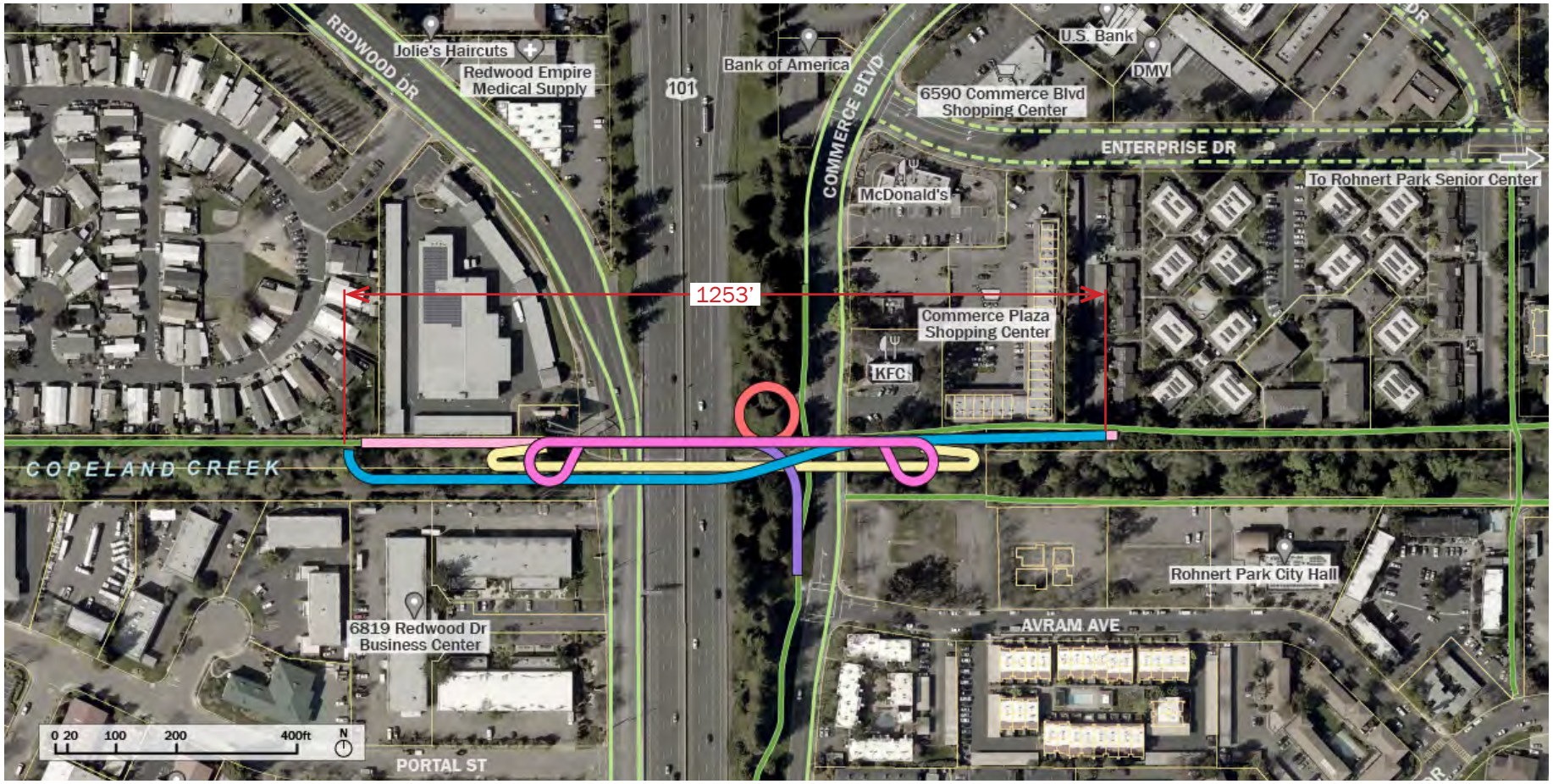
Diagram depicting a variety of overcrossing alternatives studied at Hinebaugh Creek. An overcrossing at this location would have to cross both US 101 and its on- and off-ramps. The crossing would be longer due to significant elevation differences between the touchdown locations and US 101, and the touchdowns would be far from bike/ped connections at Redwood Dr and Commerce Blvd. (SGA, 2021)

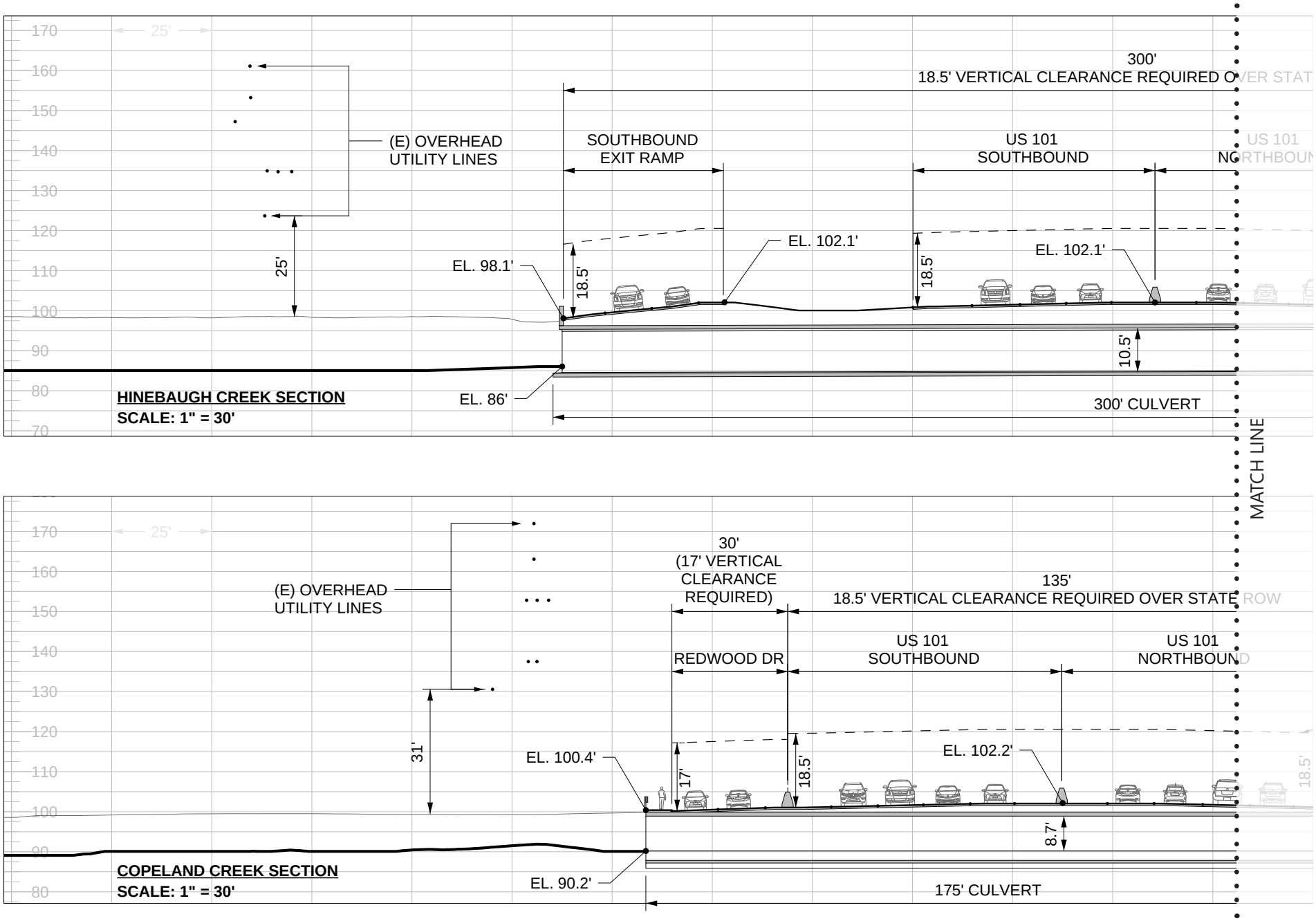


At Copeland Creek, Redwood Drive and Commerce Boulevard run adjacent to or near US 101, which makes it possible for an overcrossing to also span the frontage roads. Depending on the alignment of an overcrossing, the billboard, trees, and high-voltage electrical transmission wires adjacent to Redwood Drive and Commerce Boulevard may be impacted.

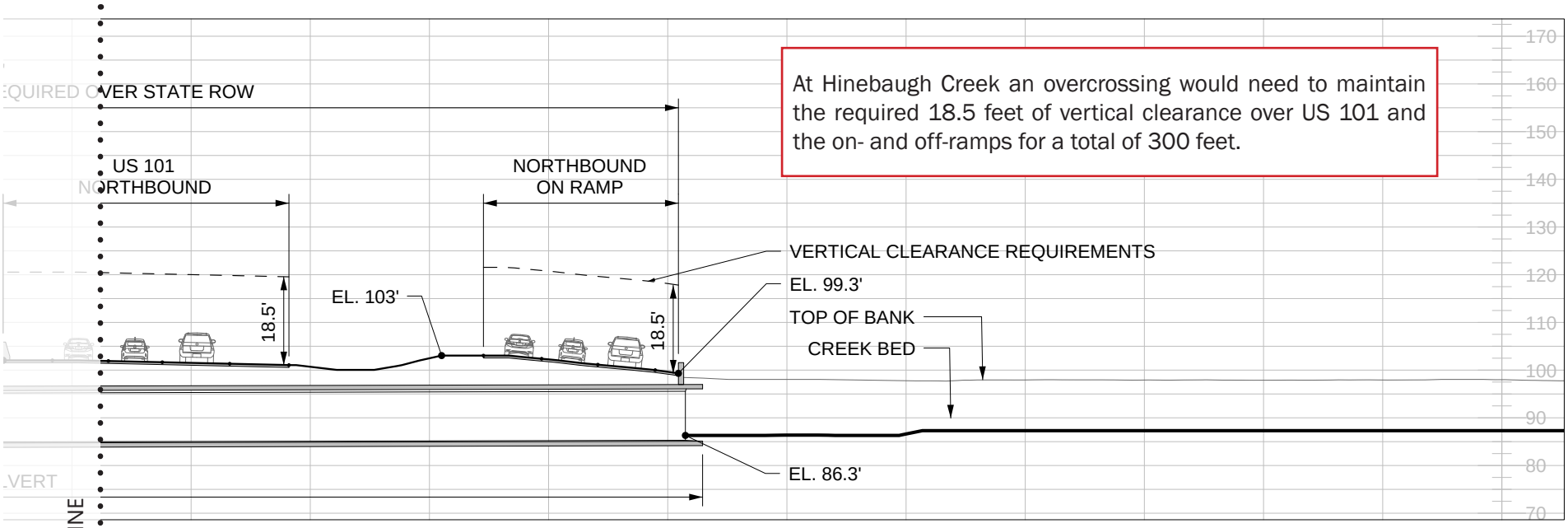
At both creek locations, even if a new overcrossing was constructed, the culverts might still be used as a shorter informal undercrossing. However, usage of the culverts can be reduced and deterred by designing the overcrossing's approaches and touchdown area to be more inviting and convenient to use.

Diagram depicting a variety of overcrossing alternatives studied at Copeland Creek. An overcrossing at this location could cross both US 101 and Redwood Dr and connect directly to existing bike/ped facilities. Alternatives that also cross over Commerce Blvd would require an additional length of approximately 300 feet. (SGA, 2021)

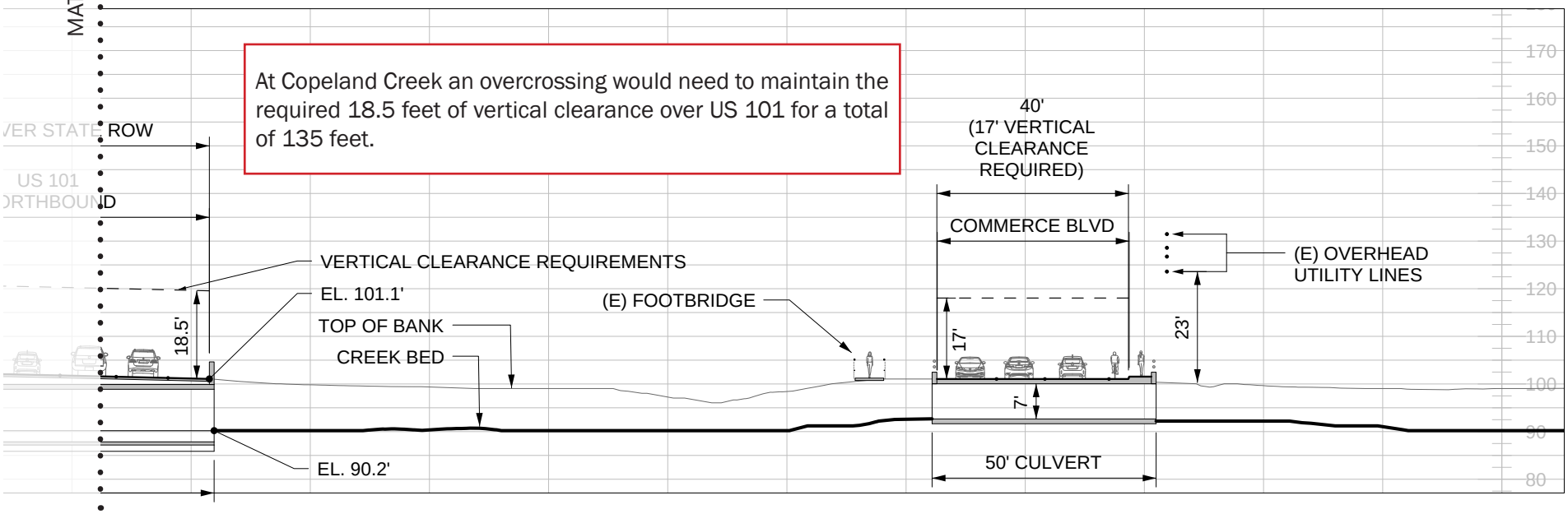




East-west sections of Hinebaugh Creek and Copeland Creek (SGA, 2021)


At Hinebaugh Creek an overcrossing would need to maintain the required 18.5 feet of vertical clearance over US 101 and the on- and off-ramps for a total of 300 feet.
VER STATE ROW
US 101
NORTHBOUND
NORTHBOUND
ON RAMP
VERTICAL CLEARANCE REQUIREMENTS
EL. 99.3'
TOP OF BANK
CREEK BED
EL. 103'
18.5'
18.5'
EL. 86.3'
170
160
150
140
130
120
110
100
90
80
70

MATCH LINE


At Copeland Creek an overcrossing would need to maintain the required 18.5 feet of vertical clearance over US 101 for a total of 135 feet.
ROW
US 101
D
40'
(17' VERTICAL
CLEARANCE
REQUIRED)
COMMERCE BLVD
VERTICAL CLEARANCE REQUIREMENTS
EL. 101.1'
TOP OF BANK
CREEK BED
(E) FOOTBRIDGE
(E) OVERHEAD
UTILITY LINES
18.5'
17'
23'
7'
EL. 90.2'
50' CULVERT
170
160
150
140
130
120
110
100
90
80

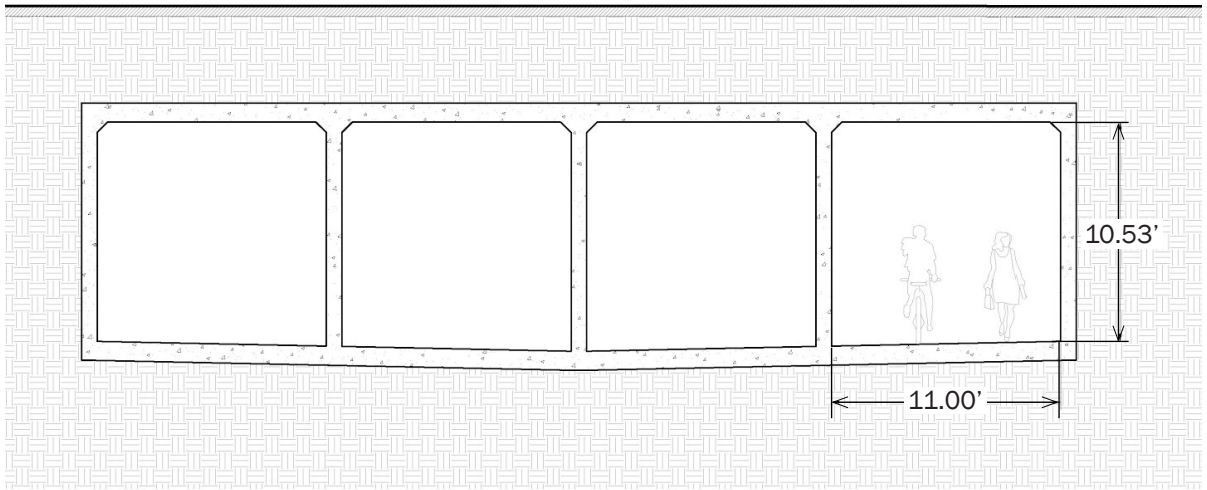
Undercrossing

Although there are precedents in other US states for modified culverts serving as bike/ped undercrossings, the culverts at both Hinebaugh Creek and Copeland Creek do not meet the State's guidelines for bike/ped undercrossings. At Hinebaugh Creek, the culvert has a width of approximately 11 feet, and the HDM states that a Class I undercrossing should have a minimum width of 12 feet, including 2-foot-wide shoulders on each side. The HDM states that a Class I bike/ped undercrossing should have a minimum vertical clearance of 10 feet, but developing one of the barrels of the Copeland Creek culvert into a bike/ped undercrossing only provides a clearance of approximately 8.5 feet. Although the height and width guidelines are not strict requirements and can therefore be addressed through the Caltrans design exception process, user safety and hydraulics would be a significant consideration during review of design exceptions.

With a length of over 300 feet, the Hinebaugh Creek culvert has higher risks for user safety, and would need security measures such as constant illumination and frequent security patrols. Although the 175-foot-long culvert at Copeland Creek is shorter than the culvert at Hinebaugh Creek, constant illumination and frequent security patrols would also be needed in a tunnel at this location.

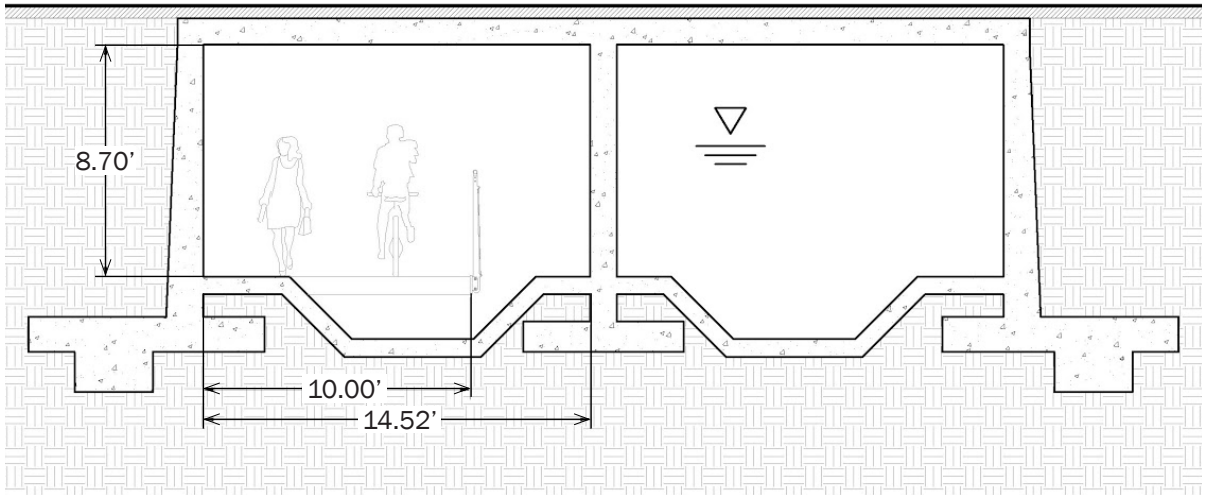
Aerial view over Copeland Creek, showing cyclists riding east along an existing informal trail towards Commerce Blvd after exiting the culvert under US 101 (SGA, 2021)

Conceptual undercrossing alignment at Hinebaugh Creek with ADA compliant approaches (SGA, 2020)



Cross-sectional drawing depicting existing Hinebaugh Creek culvert conditions and potential bike/ped path (SGA, 2020)

Conceptual undercrossing alignment at Copeland Creek with ADA compliant approaches (SGA, 2020)



Cross-sectional drawing depicting existing Copeland Creek culvert conditions and potential bike/ped path with safety railing (SGA, 2020)

5.2. HYDRAULICS

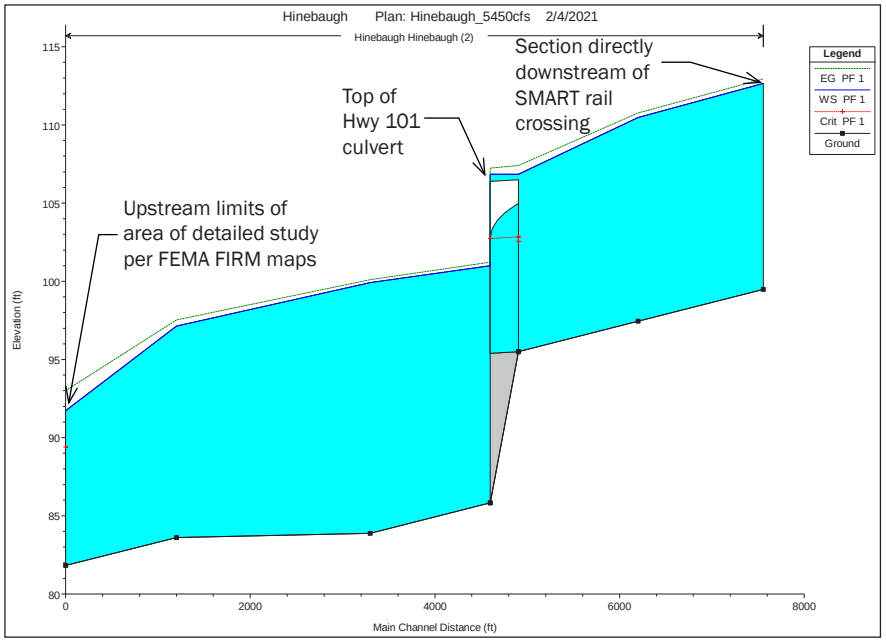
During heavy storm seasons, such as in 2014, 2017, and 2021, flooding occurs along both Hinebaugh Creek and Copeland Creek, with water reaching the top-of-bank level and submerging the creek trails. Therefore, an undercrossing at either location would need to be closed periodically, and frequent maintenance would be required to remove debris or silt. Despite the risk to safety caused by high or rising water, people might still use an undercrossing during storm events. Therefore, warning signs and security features may also need to be installed. Furthermore, runoff from large storm drain outfalls into Copeland Creek on the west side of US 101 adjacent to Redwood Drive would also impede bike/ped travel through an undercrossing.

A hydraulic assessment was conducted to determine the existing capacity of the culverts to convey stormwater. Based on preliminary hydraulic modeling of Hinebaugh Creek and Copeland Creek, the assessment found that neither of the creek culverts are large enough to contain their respective 100-Year Flows, with flood levels exceeding top-of-bank elevations by as much as 2.7 feet. Therefore, modifications necessary to develop an official bike/ped undercrossing within the existing structure would exacerbate upstream flooding issues and must be ruled out. See Appendix C for full assessment.

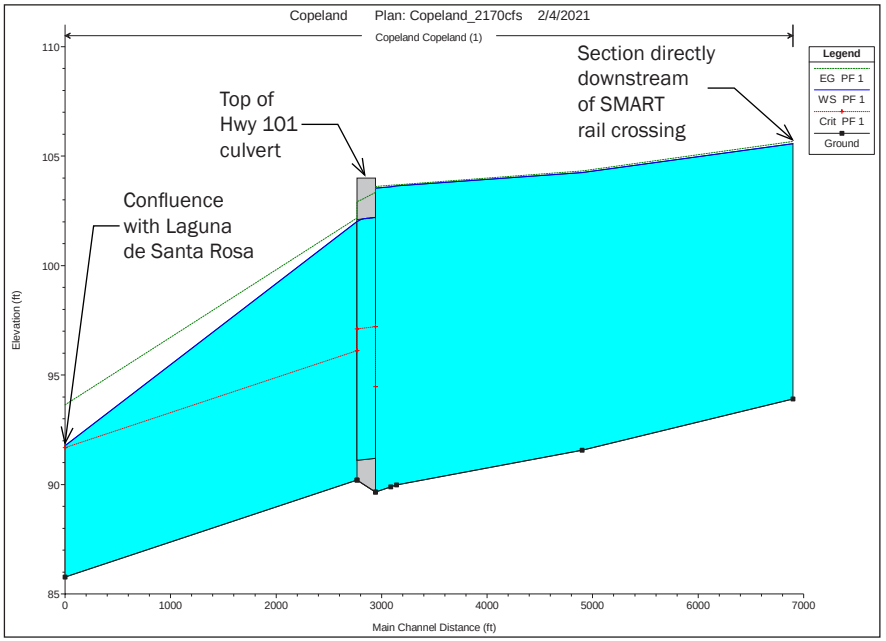
During the City Council meeting on October 26, 2021, the City Manager suggested that the City should further explore adding a barrel to the existing culvert under US 101 at Copeland Creek to address flooding. At the time of this Study's completion, an additional detailed hydraulic analysis of the creek is currently underway and will be published as an addendum.

Top: Flooding of Hinebaugh Creek at Redwood Dr in 2014 (ABC 7 News, 2014)

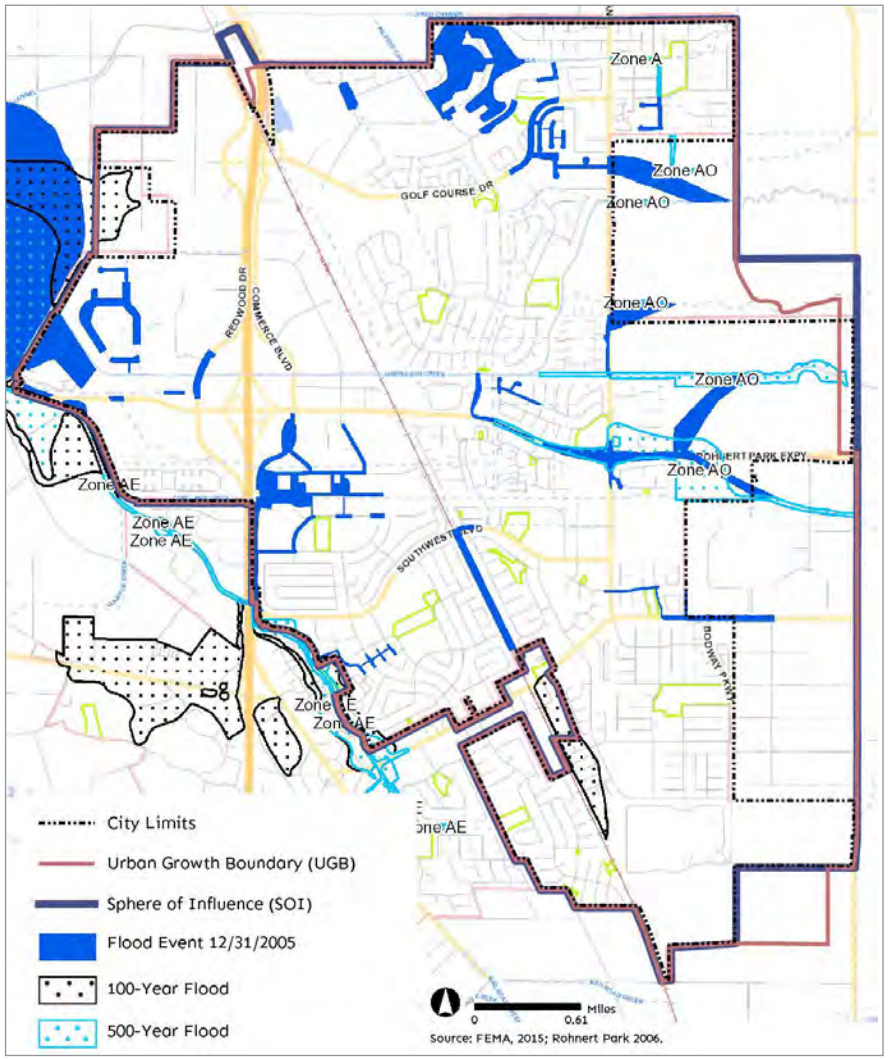
Bottom: View of Copeland Creek culvert under Redwood Dr, showing a large storm drain outfall adjacent to the wingwall and pathway (SGA, 2021)



Hinebaugh Creek Culvert Flow Capacity Diagram (BKF Engineers, 2021)



Copeland Creek Culvert Flow Capacity Diagram (BKF Engineers, 2021)



Map of flood risk and 2005 flood event (Rohnert Park General Plan Update Climate Change Whitepaper, 2019)

View west along Hinebaugh Creek from Commerce Blvd (SGA, 2021)

5.7. CREEK ASSESSMENT SUMMARY

Developing an overcrossing of US 101 is feasible at both creek locations. An overcrossing at Copeland Creek location should be prioritized, since it would serve more community members and connects to continuous bike/ped facilities. Therefore, this Study includes a detailed examination of a new US 101 bike/ped overcrossing at Copeland Creek.

When asked where a new bike/ped crossing should be located if the City chooses to move forward, 81% chose Copeland Creek. If an overcrossing were built, 67% anticipated that it would be well used, and 28% thought that it would be lightly used.

Since the project is located in an urbanized area, at a freeway, along creeks that have been channelized, and not immediately adjacent to residences, this Study does not anticipate any significant environmental impacts as a result of the project. It is anticipated that any other impacts can be reduced to less-than-significant levels through avoidance, minimization, and mitigation measures.

Based on the findings of the detailed assessments of both creek locations, developing an undercrossing of US 101 using an existing culvert is not feasible.

6. DESIGN RECOMMENDATIONS

6.1. NEW US 101 OVERCROSSING AT COPELAND CREEK

6.2. AT-GRADE IMPROVEMENTS

6.3. IMPROVEMENTS RECOMMENDED FOR FURTHER STUDY

6. DESIGN RECOMMENDATIONS

To address the goals and issues identified by the Rohnert Park community, design solutions for a new bike/ped facility need to perform three basic functions:

Safe Making: Design solutions must improve safety for pedestrians and cyclists.

Path Making: Design solutions must better connect the active transportation network to enhance the ways people can get from one place to another without the use of an automobile.

Place Making: Design solutions must provide outdoor public resting and pausing spaces which are connected by, or occur along pathways. Small and large outdoor public spaces increase the attractiveness of walking and biking by creating a series of places that facilitate modal mixing at intersections, as well as places that provide shade and foster community by facilitating interaction, rest, people-watching, and reflecting. By facilitating the active use of spaces, inhabitation and loitering can also be deterred, which contributes to safe making. In the urban environment, public spaces need not be large, park-like, or even quiet. In addition to spaces at the ends of pathways, the connections themselves, such as a bridge over a freeway, can become destinations that serve as landmarks, as well as opportunities for discovery and creative expression.

6.1. NEW US 101 OVERCROSSING AT COPELAND CREEK

At the Copeland Creek location, over 50 preliminary overcrossing alignment alternatives were developed based on design constraints and guidelines for bike/ped facilities. All alignment alternatives were conceptualized with a total out-to-out width of 14 feet for the structure, which would provide clear width of approximately 12 feet for the bike/ped traveled way. Site conditions provide ample opportunity for an overcrossing that would be architecturally graceful and unique to Rohnert Park, serving as a gateway and landmark symbol at the City's southern edge on US 101.

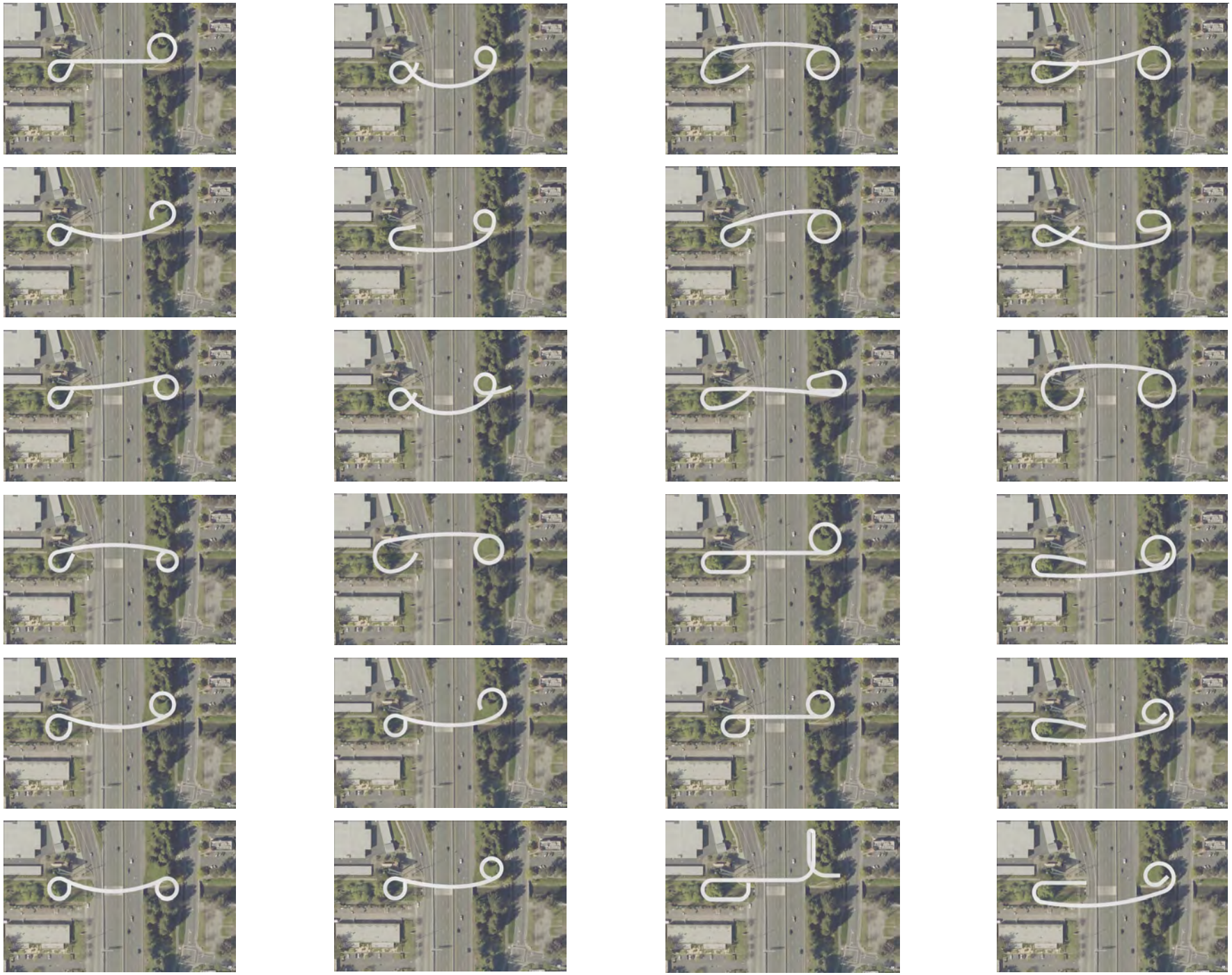
Copeland Creek Touchdown Locations Assessment

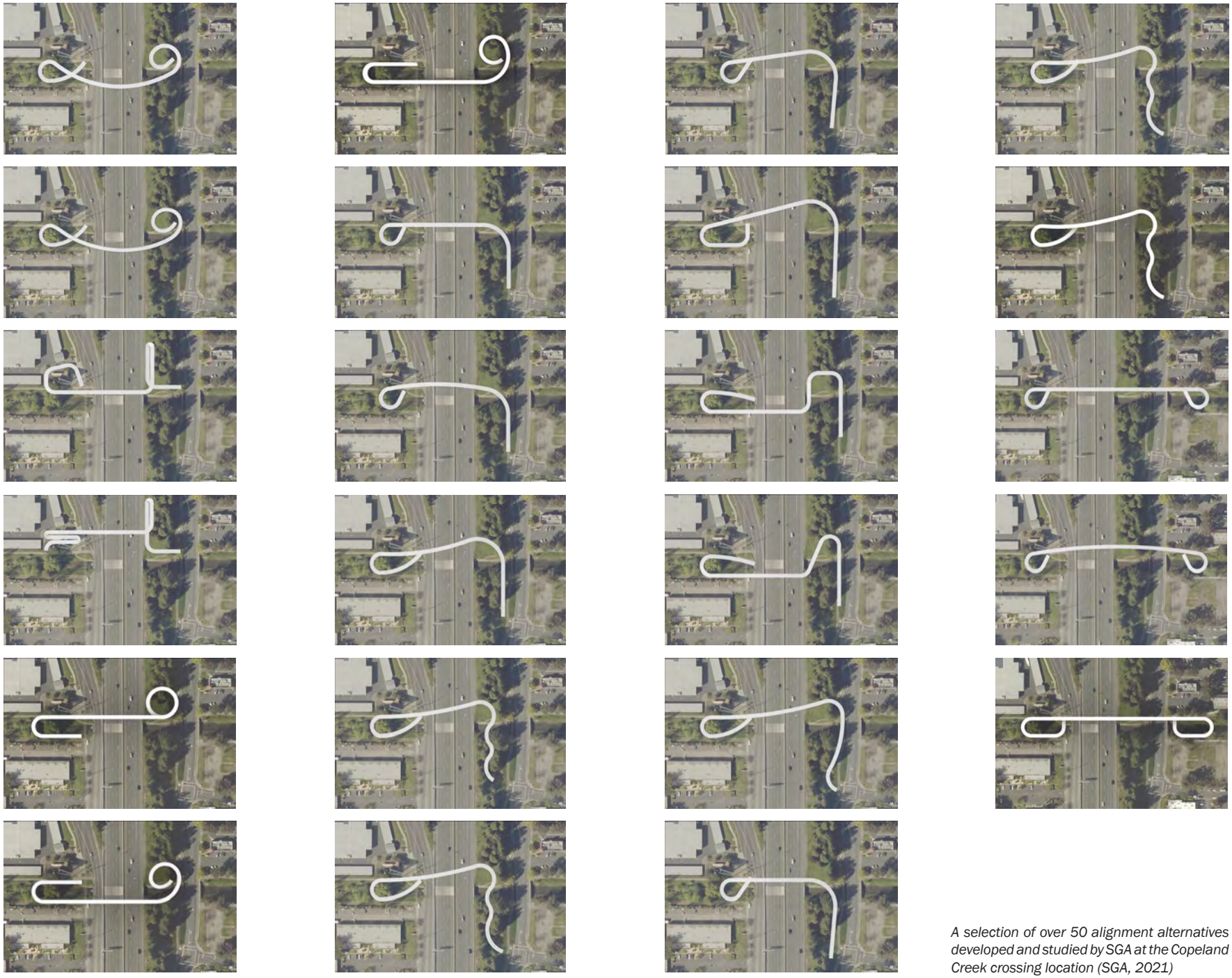
The development of alignment alternatives resulted in two west side locations and five east side locations where an overcrossing could touch down. These seven locations were assessed in a variety of ways.

The assessment of touchdown locations found that if the crossing's touchdowns are located further from the freeway, they would facilitate east-west travel along the Copeland Creek Trail better than north-south travel. However, the sidewalk along Redwood Drive provides bike/ped access to key destinations in both Rohnert Park and Cotati, and the Class I path adjacent to Commerce Boulevard is an important non-vehicular connection to residential neighborhoods in southern Rohnert Park. To ensure that an east-west overcrossing would still provide easy access to important north-south connections, touchdown "2" on the west side of US 101, and touchdown "E" on the east side, were eliminated from further study.

Touchdown "D," which is located on the Copeland Creek Trail adjacent to Commerce Boulevard, provides direct access to the bike/ped network. However, connecting to this location would require a longer structure to meet vertical clearances over Commerce Boulevard, as well as relocation of high-voltage electrical transmission lines. Furthermore, the touchdown is located immediately adjacent to the 90-unit Bella Creek residential project, currently under construction, so connecting to it could result in adjacency issues. For these reasons, touchdown "D" was also eliminated from further study.

Map of assessed touchdown locations, with rejected touchdown locations in gray (SGA, 2021)





A selection of over 50 alignment alternatives developed and studied by SGA at the Copeland Creek crossing location (SGA, 2021)

Conceptual Alternatives Assessment

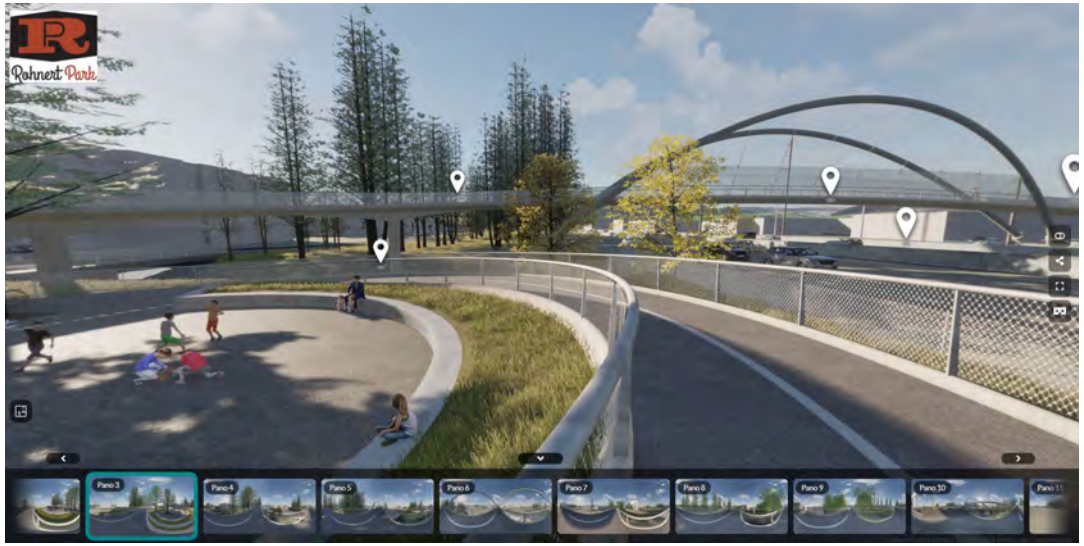
Following the assessment and elimination of overcrossing touchdown locations, ten feasible overcrossing conceptual designs, which connect to touchdown "1" on the west side of US 101, and to either touchdowns "A," "B," or "C" on the west side, were analyzed and scored using a comparison matrix. The criteria used for comparison were based on factors such as user safety and experience, connectivity, impacts to existing uses and the environment, cost, and constructibility (Appendix D). Six notable overcrossing concepts are discussed in detail below.

Conceptual Alternative	Benefits	Considerations
A19 Length: 1,045 feet Westside slope: <5% Eastside slope: <5% Structure depth: 36 in	• Straight alignment over freeway and large radii provide good sightlines • Connects directly to east-west routes on west side • With new crosswalk on and north-south bike/ped Commerce Boulevard, connects to east-west bike/ped trail on east side, and north-south Class I path • Sheltered/buffered plaza opportunity on east side • Concrete box construction may be less expensive	• Concrete box structure requires support column at center median of US 101 and may impact culvert structure • Support column on west side impacts existing underground utilities • Several trees on the east side need to be removed • Deeper structure depth may increase visual impact along designated scenic view corridor
A31 Length: 1,009 feet Westside slope: <5% Eastside slope: <5% Structure depth: 24 in	• Clear-span tied arch structure does not require supports in the freeway • Connects directly to east-west routes on west side • With new crosswalk on and north-south bike/ped Commerce Boulevard, connects to east-west bike/ped trail on east side, and north-south Class I path • Sheltered/buffered plaza opportunity on east side • Thinner structure depth may reduce visual impact along designated scenic view corridor	• Crossing creek 4 times and may result in more biological impacts • 2 or 3 smaller trees on the east side need to be removed • Design exception needed for tighter radii of curvature on approaches, which do not meet State guidelines • Steel main span structure may be more expensive than concrete

A33
 	
Length: 1,022 feet
Westside slope: <5%
Eastside slope: <5%
Structure depth: 36 in
	• Does not cross creek or impact existing trees, resulting in the fewest biological impacts
	• Connects directly to east-west creek trail on west side
	• With new crosswalk on Commerce Boulevard, connects to east-west bike/ped trail on east side, and north-south Class I path
	• Concrete box construction may result in a less expensive structure
		• Concrete box structure requires support column needs at center median of US 101
		• City-owned property on west side needs to be fully utilized:
		  ▫ Utility building needs to be demolished
		  ▫ Water pump and tank need to be replaced with a variable frequency drive
		  ▫ Billboard needs to be removed and future revenues will be lost
		• Long approaches with tight switchbacks on east and west side may be less safe and more difficult to use for cyclists
		• Design exception needed for tight radii of curvature on switchbacks, which do not meet State guidelines and compromise sightlines
		• Support column on west side impacts existing underground utilities
		• Thicker structure depth may increase visual impact along designated scenic view corridor

Conceptual Alternative	Benefits	Considerations
A36 Length: 1,010 feet Westside slope: <5% Eastside slope: <5% Structure depth: 24 in	• Clear-span tied arch structure does not require supports in the freeway • Crosses creek twice and may result in fewer biological impacts • Connects directly to east-west routes on west side • With new crosswalk on and north-south bike/ped Commerce Boulevard, connects to east-west bike/ped trail on east side, and north-south Class I path • Sheltered/buffered plaza opportunity on east side • Thinner structure depth may reduce visual impact along designated scenic view corridor	• Retaining wall on west side is parallel to creek trail and may create an uncomfortable or claustrophobic experience for trail users • Some trees on the east side need to be removed • Design exception needed for tighter radii of curvature on east approach, which does not meet best practices • Steel main span structure may be more expensive than concrete
B15 Length: 960 feet Westside slope: <5% Eastside slope: 6.5% Structure depth: 24 in	• Clear-span tied arch structure does not require supports in the freeway • Connects directly to east-west and north-south bike/ped routes on west side • Connects directly to north-south Class I path on east side, and existing crosswalks at signalized intersection at Avram Avenue • Weaving between trees on east side results in a pleasant user experience and minimizes tree impacts • Large radii provide good sightlines • Thinner structure depth may result in lower visual impact along designated scenic view corridor	• On-going maintenance on east side to remove accumulation of fallen leaves and maintain branches along pathway • East side slope of approach is greater than 5% and requires handrails and periodic landings • Crosses creek 3 times and may result in more biological impacts • 2 or 3 smaller trees on the east side need to be removed • Steel main span may be more expensive than concrete
C3 Length: 1,225 feet Westside slope: <5% Eastside slope: <5% Structure depth: 36 in	• Connects directly to east-west and north-south bike/ped routes on west side • Connects directly to east-west trail on west side • With new crosswalk on Commerce Boulevard, connects to north-south Class I path on west side • Straight alignment over freeway and large radii provide good sightlines • Concrete box construction may be less expensive than steel	• Concrete box structure requires support column at center median of US 101 and may impact culvert structure • Support column on west side impacts existing underground utilities • High-voltage electrical wires on the east side need to be relocated • Crosses creek 4 times and may result in greater biological impacts • Proximity of approach structure to high-density apartments on east side may result in adjacency issues • Long structure requires more material and may offset cost savings from concrete box construction • Long overcrossing may result in greater visual mass • Long sustained grade requires periodic landings • Thicker structure depth may result in greater visual impact along designated scenic view corridor

Aerial view of the trees on the east side of US 101 at touchdown "A" (SGA, 2021)

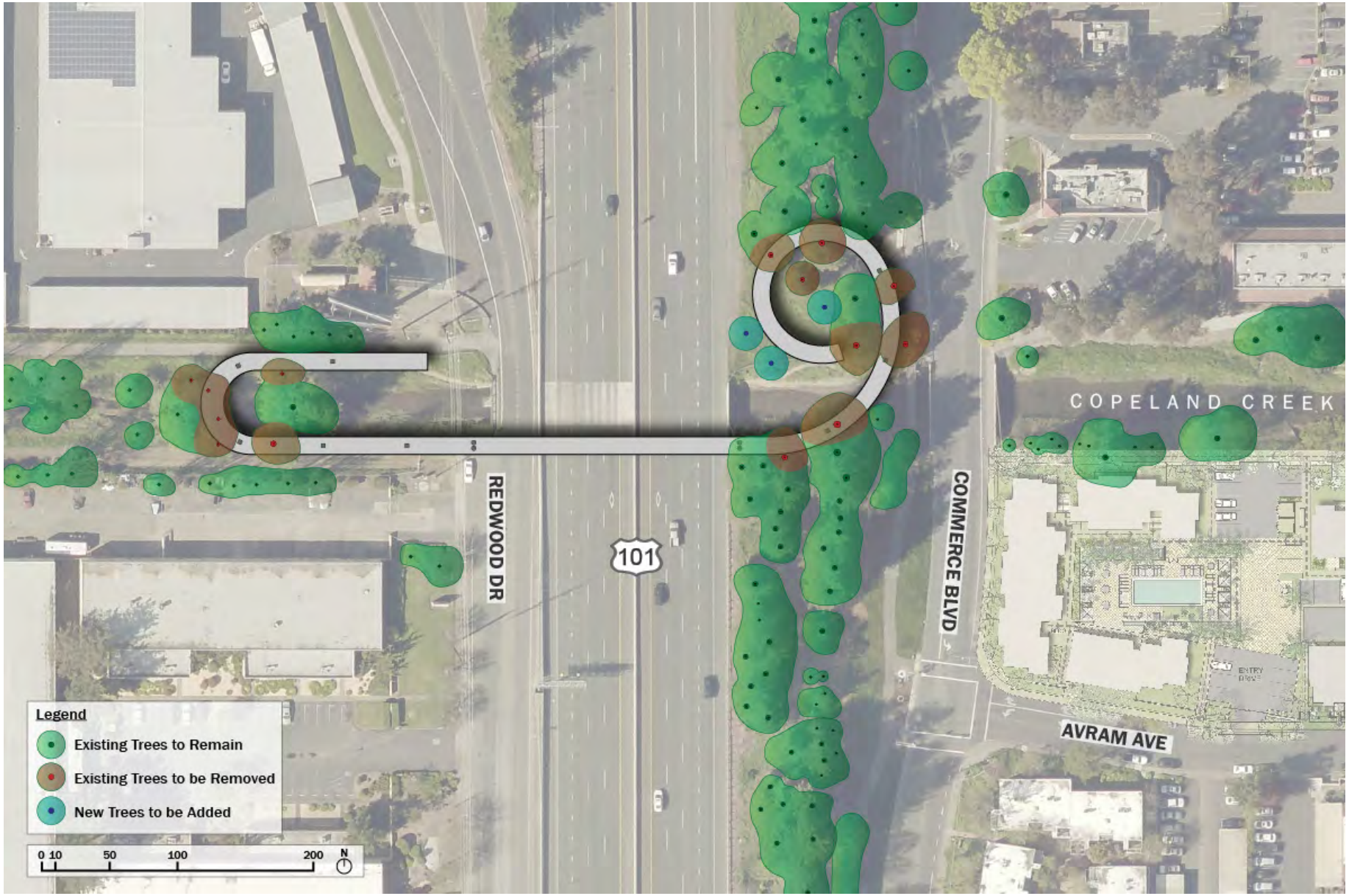


Webpage screenshot of 360-degree panorama of alternative A36, which can be accessed through the following link: https://bit.ly/RP-HWY101-A36 (SGA, 2021)

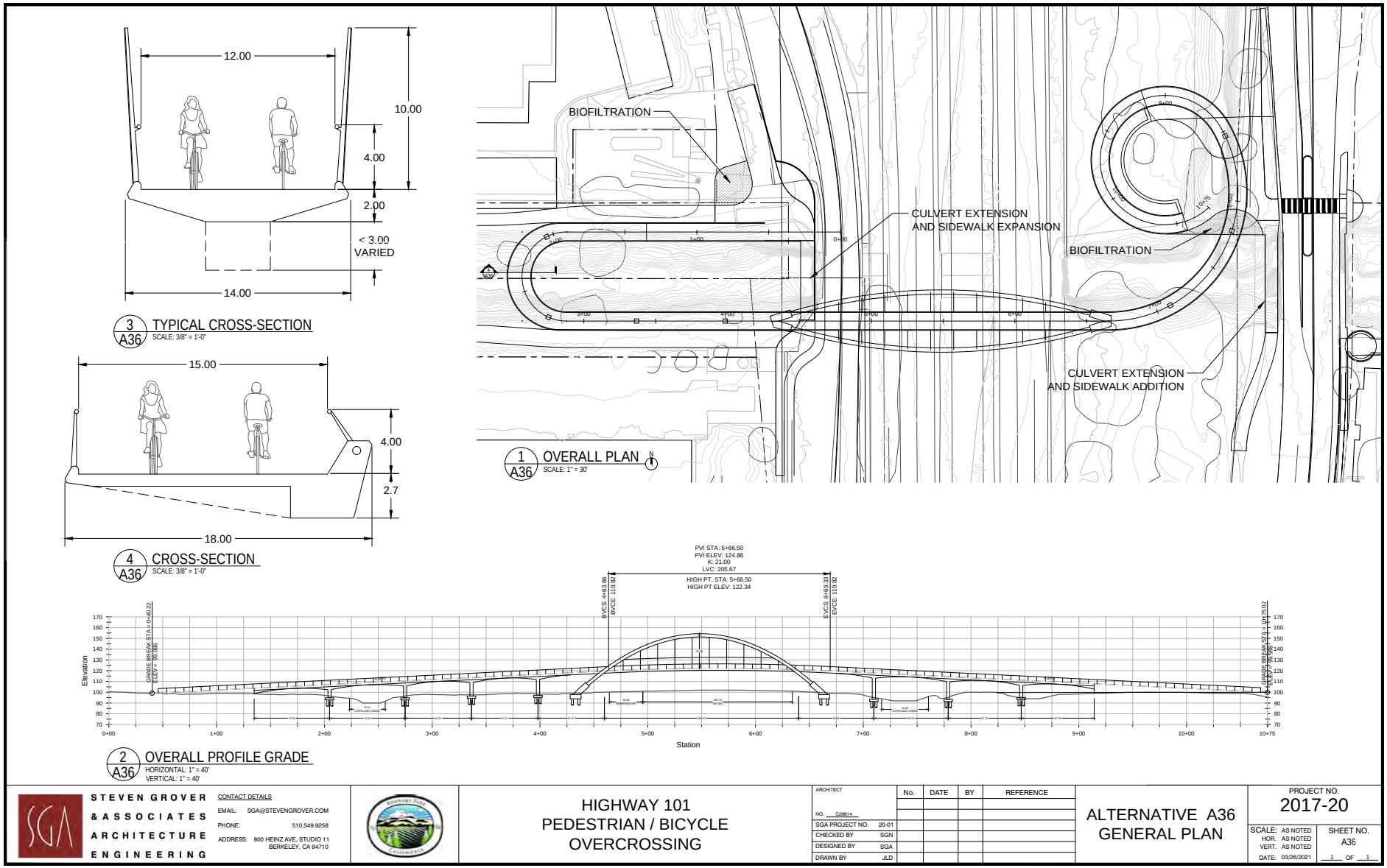
Based on a detailed assessment of the six notable conceptual design alternatives, this Study recommends alternatives A36 and B15 for further evaluation and preliminary environmental assessment. Both alternatives are compatible with structure types that clear span the freeway or structure types that require a center support in the median. A center support would require additional traffic management and may conflict with the culvert. This Study further developed these two conceptual design alternatives to assess constructibility, cost, user experience, and architectural opportunities. Through the use of a steel main span, which would result in a thinner structure, the design of the overcrossing would minimize visual impacts on the County-designated scenic view corridor and enhance the structure's visual appeal. Both conceptual design alternatives have been developed to avoid impacting major trees, and a preliminary assessment based on 3D modeling showed that an overcrossing would not obstruct visual access to the overhead freeway signs on US 101. Nevertheless, these conclusions should be confirmed through further study in subsequent project phases.

Recommended Conceptual Design Alternative A36

Conceptual design alternative A36 is approximately 1000 feet long, with a straight main span perpendicular to the freeway. The approaches on both sides of US 101 are less than the 5% slope threshold for an ADA ramp. By curving over Copeland Creek and around existing trees, the approaches also provide a unique creek experience and allow users to enjoy the natural setting and scenic view corridor. On the west side, the overcrossing connects directly to the intersection of the Copeland Creek Trail and the sidewalk along Redwood Drive, providing easy access to east-west and north-south bike/ped routes. On the east side, the overcrossing connects to the existing north-south Class I path and new at-grade crossing on Commerce Boulevard for east-west travel. The circular approach creates an intimate public plaza approximately 60 feet in diameter, with a lookout over Copeland Creek, and an entrance framed by the overhead structure adjacent to Commerce Boulevard. The plaza is buffered from freeway traffic and noise by the embankment supporting the approach, and existing redwoods provide partial shade in the day, while pedestrian and architectural lighting provide illumination at night.



Map of potential tree impacts of conceptual design alternative A36 (SGA, 2021)



Alternative A36: General Plan (SGA, 2021)

Alternative A36: Conceptual aerial rendering (SGA, 2021)

Alternative A36: Conceptual rendering of entrance to east side touchdown plaza, pedestrian-activated crossing signal, and widened sidewalk along Commerce Blvd (SGA, 2021)

Alternative A36: Conceptual rendering of east side touchdown plaza between Commerce Blvd and US 101 (SGA, 2021)

Alternative A36: Conceptual rendering of main span butterfly arch over US 101 at sunset (SGA, 2021)

Alternative A36: Conceptual rendering of main span butterfly arch over US 101 (SGA, 2021)

Alternative A36: Conceptual rendering of west side touchdown adjacent to Copeland Creek Trail (SGA, 2021)

Top: Conceptual rendering of main span butterfly arch from US 101 northbound (SGA, 2021)

Right: Conceptual rendering of concrete box girder alternative at Copeland Creek (SGA, 2021)

Aerial view of the trees on the west side of US 101 along Copeland Creek at touchdown "1" (SGA, 2021)

Webpage screenshot of 360-degree panorama of alternative B15, which can be accessed through the following link: https://bit.ly/RP-HWY101-B15 (SGA, 2021)

Recommended Conceptual Design Alternative B15

Conceptual design alternative B15 is approximately 950 feet long, with a main span that curves slightly (1,500-foot radius), but asymmetrically, over US 101. The approach slope on the west side is less than 5%, easy to use by all abilities, provides good sight distance, and connects directly to the intersection of the Copeland Creek Trail and the sidewalk along Redwood Drive. The alignment of the approach, touchdown, and main span provide users with key views of the overcrossing.

On the east side, however, the approach is 6.5%, and includes landings and handrails to meet accessibility requirements. The east side approach weaves through two parallel lines of existing redwood trees and provides a unique travel experience for users. The touchdown area at the intersection of Avram Avenue and Commerce Boulevard provides an opportunity to develop a spacious public plaza with landscaping.

Although the east side touchdown connects directly to the north-south Class I path along Commerce Boulevard at the signalized intersection at Avram Avenue, approximately 250 feet south of Copeland Creek, users who want to continue traveling east-west must U-turn back to the creek, or travel east-west on Avram Avenue. Avram Avenue may be less conducive to bicycle travel, since it is approximately 35 feet wide with parallel parking on both sides, and cross traffic does not stop at its intersection with Santa Alicia Drive.

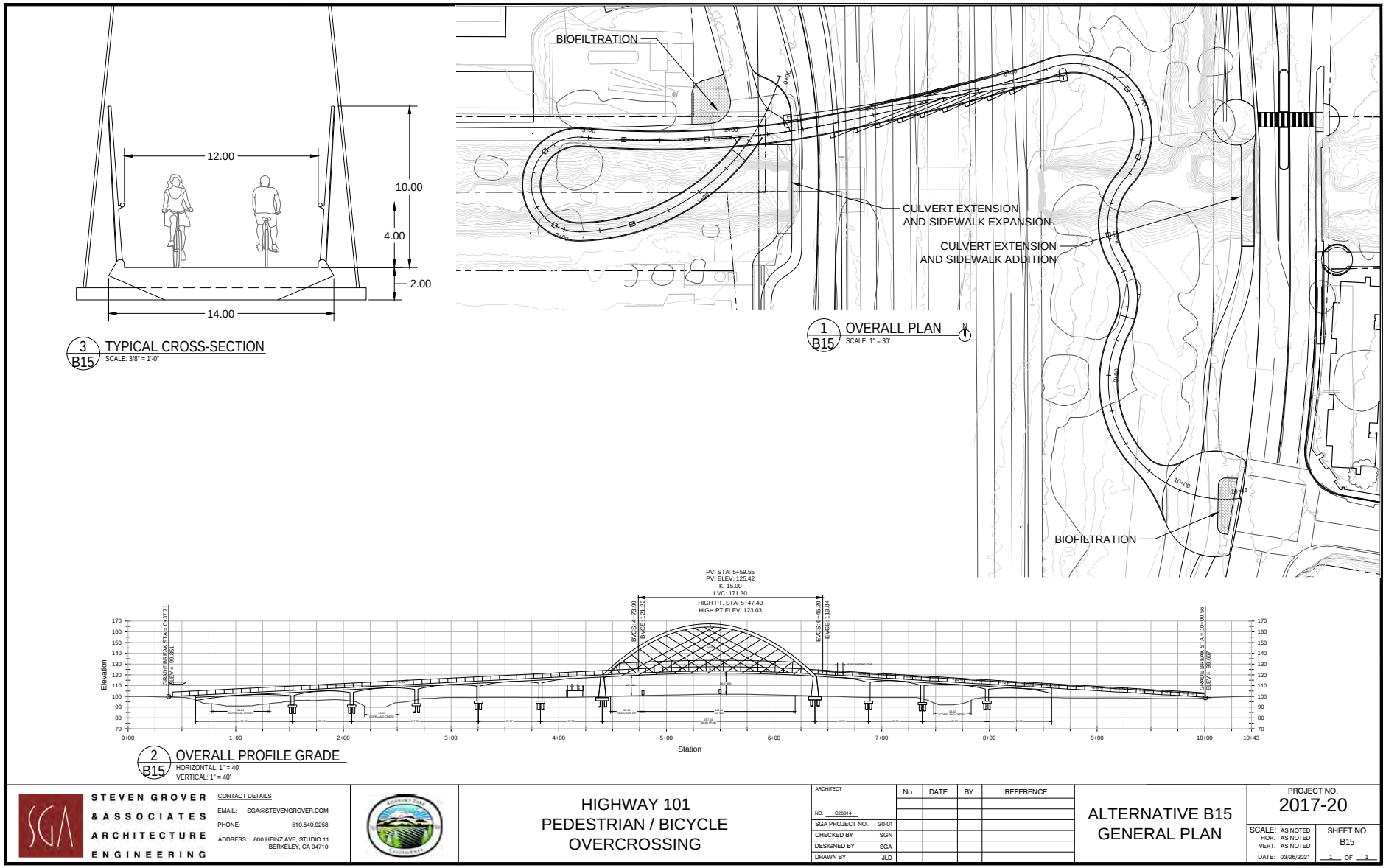
Public Input on the Design Alternatives

During the Public Workshop conducted on May 6, 2021, community members were polled for their input on the design of the overcrossing. Based on the responses, 63% preferred alternative A36 with its butterfly arches structure, gentle approach slopes on both sides, and circular touchdown plaza on the east side at Copeland Creek.

38% preferred alternative B15's single arch, slightly steeper east side approach through the trees, and touchdown at Avram Avenue.

No attendees preferred the concrete box girder alternative.

Map of potential tree impacts of conceptual design alternative B15 (SGA, 2021)



Alternative B15: General Plan (SGA, 2021)

Alternative B15: Conceptual aerial rendering (SGA, 2021)

Alternative B15: Conceptual rendering of east side touchdown at the intersection of Commerce Blvd and Avram Ave (SGA, 2021)

Alternative B15: Conceptual rendering of west side touchdown and widened sidewalk along Redwood Dr (SGA, 2021)

Alternative B15: Conceptual rendering of main span arch over US 101 at sunset (SGA, 2021)

Alternative B15: Conceptual rendering of main span arch over US 101 (SGA, 2021)

Alternative B15: Conceptual rendering of main span arch from US 101 northbound (SGA, 2021)

Alternative B15: Conceptual rendering of bridge approach and main span arch from Commerce Blvd at Copeland Creek (SGA, 2021)

City Council Input on the Design Alternatives

On October 26, 2021, this Study was presented to the Rohnert Park City Council. Councilmembers were asked to review the US 101 bike/ped crossing location assessment and overcrossing recommendations, and review proposed designs and cost estimates.

Following a discussion of the conceptual design alternatives, the City Council expressed its unanimous support for the Study's recommendations and directed City staff to:

- Move forward with developing a new bike/ped overcrossing of US 101 at Copeland Creek;
- Pursue conceptual design alternative A36, with butterfly arches and circular plaza at the east side touchdown;
- Proceed with the Project Initiation Document phase; and,
- Seek grant funding for the project.

The staff report and meeting minutes published by the City are included in Appendix A.

Top left: Vanessa Garrett, Director of Public Works, and Steven Grover, Principal of SGA, present the Study to the City Council on October 26, 2021 (Rohnert Park, 2021)

Top right: The City Council discusses the Study and conceptual design alternatives (Rohnert Park, 2021)

Right: Conceptual aerial rendering of design alternative A36 (SGA, 2021)

Conceptual rendering of main span butterfly arch over US 101 and west side touchdown area (SGA, 2021)

Conceptual rendering of entrance to east side touchdown plaza and overcrossing (SGA, 2021)

Notable Quotes from the City Council

Mayor Gerard Giudice

"I like the butterfly bridge very much."

"I think having it out in the daylight, and it being very architecturally and aesthetically pleasing, if the money is there and supports that, I think that really gives that entire area an enormous facelift and a huge development piece, and I think it makes it very attractive. I think the bridge is the way to go, I like the butterfly bridge, I really like that whole idea of the little pedestrian landing and doing something there, whether it's some kind of statue in the center, or water feature, or just doing something there, that's a little more of a focal point, I think will bring a lot of pride and community spirit in that area that really could use it."

Vice Mayor Jackie Elward

"The [butterfly bridge] speaks more to who we are and what is needed."

Councilmember Susan Hollingsworth-Adams

"I think we're going to have a beautiful landmark in Rohnert Park."

"I think the double arches is beautiful; I love your design."

"I think it's gorgeous."

Councilmember Willy Linares

"I think it's great. I like the design and the ability to give us some sort of landmark."

Councilmember Pam Stafford

"This is amazing. When I first heard about an overcrossing, I didn't have any concept of the design that you could do to make this not intrude into the neighborhoods. This is a really incredible design."

An existing guardrail and lack of a safe crossing on Commerce Blvd at Copeland Creek hinders east-west access (SGA, 2021)

A group of cyclists informally cross Commerce Blvd at Copeland Creek to reconnect to the creek trail (SGA, 2021)

6.2. AT-GRADE IMPROVEMENTS

This Study identified several at-grade improvements that should be implemented together with a new overcrossing to address existing bike/ped access and safety issues near the Copeland touchdown locations.

New crosswalk and pedestrian-activated signal

On the east side of US 101, Commerce Boulevard presents a barrier to cyclists and pedestrians desiring to connect between the north-south Class I path and the east-west Copeland Creek Trail. Although there is an existing crosswalk at the signalized intersection at Avram Avenue approximately 250 feet south, public comments and field observations indicate that cyclists and pedestrians typically cross Commerce Boulevard unsafely at the creek, instead of using the existing crosswalk at Avram Avenue.

If a new US 101 bike/ped overcrossing at Copeland Creek lands in the area of Commerce Boulevard, the demand to cross the roadway will increase. Therefore, this Study included a pedestrian crossing assessment to determine what new pedestrian crossing treatment would be feasible and warranted. See Appendix E for full assessment.

The assessment found that a Pedestrian Hybrid Beacon (PHB), also known as a High-Intensity Activated crossWalK beacon (HAWK), is warranted, including advance stop lines, signage, and a high-visibility crosswalk. The new crosswalk should align with the northern creek path to maximize separation from the Avram Avenue signal and optimize convenience for the greatest number of potential users. The assessment determined that vehicle queues generated as a result of the implementation of a PHB would not extend to the nearby signalized intersections of Commerce Boulevard and Avram Avenue or Commerce Boulevard and Enterprise Drive.

The assessment further determined that since there is no shoulder on Commerce Boulevard at this location, curb extensions would not be appropriate. However, the assessment recommended a median pedestrian refuge island to provide additional protection to crosswalk users, while maintaining existing vehicular circulation and travel patterns at nearby driveways. The portion of the refuge island to the south of the new crossing would be mountable to allow access for Sonoma Water's maintenance vehicles.

Conceptual rendering of new crosswalk and pedestrian-activated signal, which would provide safer access across Commerce Blvd and connect to Copeland Creek Trail (SGA, 2021)

Conceptual aerial rendering of new crosswalk and signal on Commerce Blvd at Copeland Creek (SGA, 2021)

Sidewalk Widening

Currently, at touchdown location "A," there is a sidewalk north of Copeland Creek, a Class I path along Commerce Boulevard south of the creek, and a 5-foot-wide prefabricated steel truss footbridge that closes the gap across the creek.

Since a new bike/ped overcrossing would increase demand for the connection between touchdown "A" and the Class I path into south Rohnert Park, the width of the existing footbridge may be inadequate in the future. This Study recommends adding a section of concrete box culvert, or spanning the creek with a concrete slab, to create a 10-foot-wide sidewalk and a shoulder for the roadway. The existing footbridge would be removed and relocated or repurposed. With a new sidewalk and curb, a crash barrier end-treatment would also no longer be needed, further improving vehicular safety. A possible relocation spot for the footbridge would be in the City's F and H Sections, where it could connect Fauna Avenue with Holly Avenue, achieving a gap closure goal included the City's bike/ped master plan.

Existing Class I path and footbridge on the west side of Commerce Blvd at Copeland Creek (SGA, 2021)

On the west side of US 101, adjacent to touchdown location “1,” the width of Redwood Drive over the Copeland Creek culvert is reduced to 30 feet from its typical width of approximately 70 feet. Pedestrians traveling north-south between Rohnert Park and Cotati are required to use an existing 4-foot-wide sidewalk adjacent to traffic, and a shoulder for vehicles is absent.

This Study recommends adding a section of concrete box culvert, or spanning the creek with a concrete slab, to widen the sidewalk, add a shoulder to the street, and enhance the bike/ped mixing zone to improve access to the overcrossing.

Existing 4-foot-wide sidewalk on Redwood Dr at Copeland Creek (SGA, 2021)

Copeland Creek Trail and Laguna Drive Connection

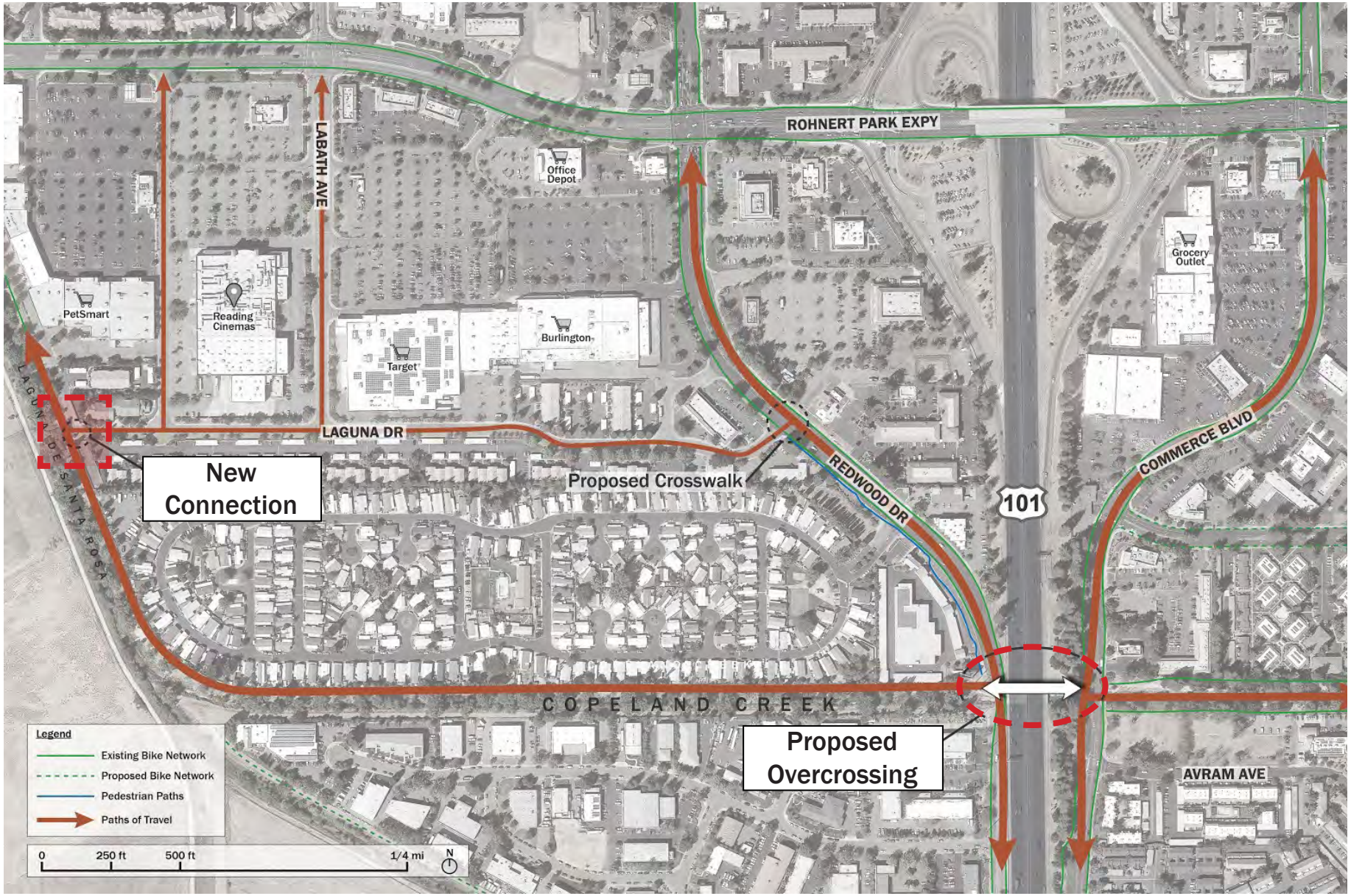
From touchdown location "1" on the west side of US 101, Copeland Creek Trail extends approximately one mile northwest to Rohnert Park Expressway. Approximately halfway along this route, at the western terminus of Laguna Drive, the trail runs adjacent to the Muirfield Apartments and Manor Apartments. A 20-foot-wide landscape strip separates the driveway for the apartments from the trail, and wear patterns indicate that people cross through the landscape area to travel between the trail and Laguna Drive.

Laguna Drive runs parallel to the 168-unit Edgewood Apartments complex, provides access to the Rohnert Park Expressway shopping plaza identified by the community as a top destination, and links to Labath Avenue, which connects to the City's industrial area and Stadium Lands Planned Development District Therefore, this Study recommends that the City develop an official connection, as a local project, between Laguna Drive and Copeland Creek Trail. This would require the acquisition an easement of approximately 200 feet to connect the Copeland Creek Trail and the Laguna Drive cul-de-sac. Additionally, this Study recommends turning Laguna Drive into a bike route, since it is a low-stress street that is approximately 40 feet wide and has a posted speed limit of 25 mph.

Top: Satellite view of area at the west end of Laguna Dr at Copeland Creek Trail (Google, 2021)

Bottom left: Aerial detail of existing informal connection between Copeland Creek Trail and Laguna Dr (Google, 2021)

Bottom right: Street view at west end of Laguna Dr showing informal connection to Copeland Creek Trail (Google, 2021)



Map of paths of travel along existing and proposed bike/ped routes showing locations of proposed new overcrossing of US 101 and proposed connection between Copeland Creek Trail and Laguna Dr (SGA, 2021)

6.3. IMPROVEMENTS RECOMMENDED FOR FURTHER STUDY

1. New At-Grade Crossing at Redwood Drive and Laguna Drive

On the west side of US 101 south of Rohnert Park Expressway there are no crosswalks across Redwood Drive. This impedes access between the bike lanes and bus stops on either side of the road, as well as the hotel and businesses between Redwood Drive and US 101. Since Laguna Drive is an important east-west street with key connections to the creek trail, businesses, and housing, this Study recommends future evaluation of a new at-grade crossing of Redwood Drive at Laguna Drive. A preliminary assessment of the intersection suggests that a crossing could be designed to work effectively with either a new traffic signal or PHB.

2. Bike Lane Continuity and Access at Redwood Drive and Copeland Creek

Although there are existing 4-foot-wide Class II bike lanes along most of Redwood Drive in both the northbound and southbound directions, these bike lanes disappear in the area around Copeland Creek due to the narrowing of the roadway. In the southbound direction, the bike lane discontinues at Copeland Creek, and cyclists traveling further south into Cotati must ride on the sidewalk across Copeland Creek or merge into the car lane. In the northbound direction, the bike lane narrows into a 2-foot-wide shoulder for approximately 325 feet, requiring cyclists to merge with cars. Currently, it is also difficult for cyclists traveling north on Redwood Drive to turn left to access the Copeland Creek Trail. Therefore, cyclists must first cross the roadway at Portal Street, 500 feet to the south in Cotati, and ride north against traffic on the sidewalk to Copeland Creek, or pass Copeland Creek and make a U-turn at Los Feliz, 700 feet to the north. This Study recommends further study of how the bike lanes along Redwood Drive can be made continuous, and how bicycle access to the Copeland Creek Trail from the south can be made safer and more legible.

Locations of improvements recommended for further study around Rohnert Park Expy (Google, 2021)

3. New At-Grade Crossing at Redwood Drive and Hinebaugh Creek

On the west side of US 101 Redwood Drive creates a gap in the Hinebaugh Creek Trail since there is currently no crosswalk that would facilitate continuous east-west travel. Although there is an existing crosswalk at the signalized intersection at Martin Avenue approximately 300 feet north, using the crosswalk adds a detour of approximately 650 feet. This Study recommends future evaluation of a new at-grade crossing of Redwood Drive at Hinebaugh Creek which would provide access across Redwood Drive for existing residents of the adjacent hotels as well as users of a potential US 101 crossing at Hinebaugh Creek in the future. A preliminary assessment of the intersection suggests that a crossing could be designed to work effectively with a small pedestrian refuge island and either a signal or a PHB, as long as it is coordinated with the signal at Martin Avenue. In particular, the coordination would need to minimize the potential for adverse vehicle queues in the northbound left-turn lanes, which handle very heavy volumes, especially during weekend midday periods.

4. New Pathway Between Hinebaugh Creek and Rohnert Park Expressway

On the east side of US 101, where the Hinebaugh Creek Trail is interrupted by the SMART right-of-way and Foxtail Golf Club, this Study recommends future evaluation of a pathway parallel to the west side of the SMART right-of-way between the creek and Rohnert Park Expressway. A preliminary assessment of the area suggests that there may be available width for a new pathway along the western edge of the SMART right-of-way, or along the eastern edge of the City-owned parcel currently occupied by the Rohnert Park Police Department. If a crossing of US 101 at Hinebaugh Creek is developed in the future, and if a bike/ped connection over the railroad and golf course cannot be developed, a new pathway in this location would provide access between the creek trail and the existing crossing of the SMART right-of-way at the Expressway, as well as the SMART station. Users of this pathway would be able to avoid the large intersections at the Expressway and State Farm Drive and Commerce Boulevard, which have a history of collisions between vehicles with cyclists and pedestrians.

5. Incremental Improvements at Rohnert Park Expressway and US 101

The Rohnert Park Expressway area has a history of collisions between cars and pedestrian and cyclists. Heavy vehicular traffic and many conflict points create a high-stress environment, and park-and-ride users often cross the Expressway unsafely due to far crosswalks. In order to improve safety and enhance the bike/ped experience, this Study recommends incremental modifications such as improving pedestrian lighting in the west side park-and-ride connection under the Expressway, and adding a new connection on the east side of US 101 to allow park-and-ride users to access the sidewalk on the north side of the Expressway.

6. Incremental Improvements at Golf Course Drive and US 101

The Golf Course Drive underpass area has heavy vehicular traffic and many intersections and conflict points, which creates a high-stress environment with a history of collisions between cars and pedestrian and cyclists. Since it is not feasible to change the inherent nature of the vehicle-dominated intersections, this Study recommends incremental improvements that would improve safety and enhance the bike/ped environment. Potential future modifications include squaring up intersections, adding aesthetic treatments and pedestrian lighting, and replacing the Class II bike lanes with Class IV bikeways that are separated from vehicular traffic.

Location of improvement recommended for further study at Golf Course Drive (Google, 2021)

STOP
HERE ON
RED

7. IMPLEMENTATION

7.1. AT-GRADE IMPROVEMENTS

7.2. NEW OVERCROSSING

7.3. COST SUMMARY

7.4. FUNDING

7. IMPLEMENTATION

7.1. AT-GRADE IMPROVEMENTS

Depending on project funding and phasing, it could be possible for the development of the recommended at-grade improvement at the west end of Laguna Drive to occur in advance of the overcrossing as a local project. This would provide immediate benefits for active transportation and facilitate the use of the Copeland Creek Trail. Additionally, developing the new crosswalk and widened sidewalk at Commerce Boulevard would address an existing safety issue by preventing cyclists from crossing the roadway unsafely.

7.2. NEW OVERCROSSING

For Rohnert Park's US 101 Bike/Ped Overcrossing Project, which requires significant Caltrans involvement, the potential pre-construction timeline includes the three phases:

1. **Project Initiation Document (PID)** - Since the project is complex and exceeds $3 million in State right-of-way, Caltrans' review and approval of the project would be completed through the traditional PID process instead of an encroachment or permit engineering evaluation report process (PEER). A PID would likely take the form of a Project Study Report-Project Development Support (PSR-PDS) and require approximately 12 months to complete.
2. **Project Approval/Environmental Documentation (PA/ED)** - Over the course of approximately 12 months, preliminary engineering design and in-depth environmental and technical studies would be conducted to develop the environmental document for the selection of a preferred alternative. This phase would conclude with environmental clearance and the approval of a Caltrans Project Report.
3. **Plans, Specifications, and Estimates (PS&E)** - During the PS&E phase, design details would be refined to develop the project's plans, specifications, and estimates package for the advertisement of bids.

Construction Phase

Construction of a new bike/ped overcrossing in Rohnert Park would require approximately 12 months. Construction activity at Copeland Creek may need to occur over two seasons to minimize environmental impacts during months with bird migrations or greater animal activity.

Separating the construction of the overcrossing into phases is not recommended. However, should phasing be required for funding reasons, construction could occur over three phases:

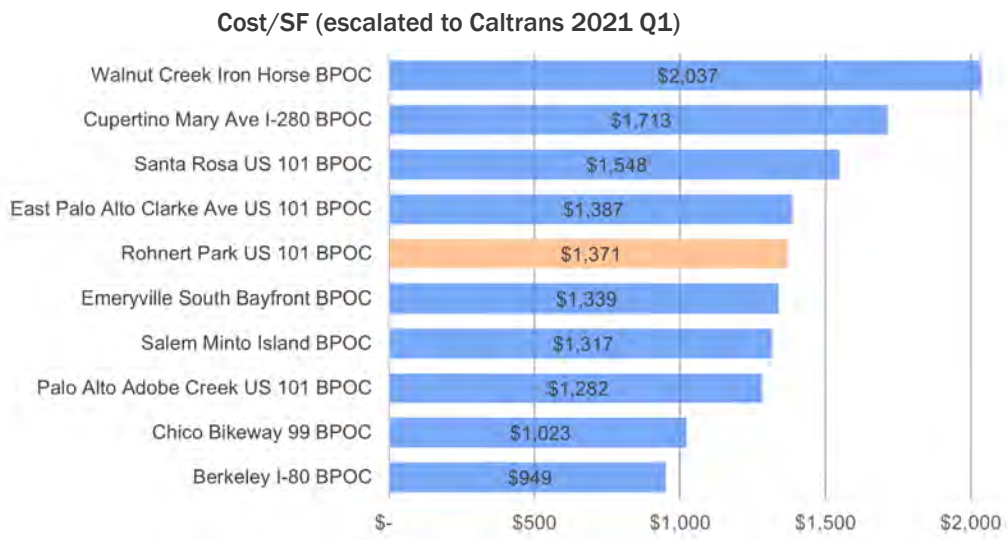
1. Phase 1 would consist of utility relocations on Redwood Drive at Copeland Creek. This phase provides no immediate benefit to the community upon its completion, since it neither improves the safety of pedestrians and cyclists crossing US 101 nor contributes to closing the existing gap in the active transportation network. Since Phase 1 work is based on cost sharing, there is also a risk that if the remaining phases are not constructed, the costs covered by utility providers would need to be reimbursed.
2. Phase 2 would consist of construction of the overcrossing and approaches, as well as hardscaping.
3. Phase 3 would consist of work related to finishing, landscaping, and amenities to enhance user experience.

7.3. COST SUMMARY

A conceptual level cost estimate for the project is summarized in the table below. Caltrans recommends contingencies of 30%-50% for cost estimates at the feasibility stage. Therefore, the cost estimates included in this Study are conservative. See Appendix F for a detailed breakdown of the conceptual cost estimates for alternatives A36 and B15.

Phase	Estimated Cost (2020)	Estimated Completion
Overcrossing Project Initiation	$450,000	2022
Overcrossing PE/Environmental	$700,000	2024
Overcrossing PS&E	$2,700,000	2025
At-Grade Improvements	$800,000	2027
Overcrossing Construction	$21,200,000	2027
Agency Support	$4,150,000	2027

Based on these feasibility level cost estimates, the average cost per square foot for the overcrossing would be approximately $1,400. The chart below provides historical and anticipated square-footage cost data from several overcrossing projects for comparison. As a potential local project, the Laguna Drive and Copeland Creek Trail connection is excluded from the cost estimates.



The construction cost of conceptual design alternative B15 is estimated to be approximately 6% lower than the construction cost of conceptual design alternative A36 due to the plaza included in the design of A36's east touchdown area. The preliminary cost estimates are based on a consideration of the main span as a tied-arch structure constructed in steel, with a concrete deck, as well as concrete approaches. It is anticipated that should the design of the overcrossing change significantly in the future, projects costs would likely increase due to work associated with new engineering, assessment, and coordination.

To evaluate potential construction cost savings, this Study also assessed a main span structure constructed using a concrete box girder, instead of steel arches. The assessment found that although a concrete main span with center support is probably feasible, it is not recommended because:

1. A support in the center median of US 101 is typically discouraged by Caltrans when other alternatives are feasible;
2. The foundation for a center support would likely conflict with the existing culvert;
3. A support is needed between Redwood Drive and US 101, which would require relocating underground utilities;
4. It results in greater impacts to freeway operations during construction and requires more traffic management;
5. A deeper structure depth creates greater visual mass over the freeway;
6. A deeper structure depth results in longer approaches, which have to be extended by an additional 40 feet; and,
7. No attendees at the May 6th Public Workshop preferred the concrete box girder alternative.

7.4. FUNDING

Following the outbreak of the 2019 novel coronavirus disease (COVID-19), the ensuing pandemic has caused people to work from home, remain physically distant, and recreate outdoors. With a decrease in commuter traffic and an increase in active transportation, many cities in the Bay Area have closed some streets to through traffic, creating a network of "slow streets" for bike/ped use. Concurrently, bicycle manufacturers and retailers have reported shortages and sellouts. Given the current rise in bike/ped use, this Study recommends building community support now, which would be critical to the City's funding pursuits for active transportation projects like this.

In March 2021, the Biden Administration unveiled The American Jobs Plan, which outlined various strategies for investing in America's infrastructure, including transportation. Following negotiations within Congress, a bipartisan infrastructure deal was passed on November 6th, which authorizes federal funding for highways, transit programs, and other projects, and includes $550 billion in new spending. Signed into law on November 15th, the Infrastructure Investment and Jobs Act (IIJA) includes:

1. $110 billion for bridge and road repairs, focusing on climate change mitigation, resilience, equity and safety for users, including pedestrians and cyclists;
2. $5 billion for grants to develop Vision Zero plans, or for projects implementing those plans; and,
3. $1 billion for a new program that reconnects neighborhoods cut off by historic transportation investments and ensures new projects increase opportunity, advance racial equity and environmental justice, and promote affordable access.

In addition to funding associated with the IIJA, a variety of federal, state, and local funding programs currently exist to support the development of active transportation infrastructure, improve safety for cyclists and pedestrians, and reduce GHG emissions from vehicles. A list of potential funding programs applicable to this project is provided below, followed by details of each funding source.

1. SB-1 LRSP Funding
2. RAISE Grant
3. OBAG Grant
4. TDA Funding
5. ATP Grant
6. Measure DD (Go Sonoma) Funding

California Senate Bill 1 Local Streets and Roads Program

Senate Bill 1 (SB-1), the Road Repair and Accountability Act of 2017, invests $54 billion over the next decade to fix roads, freeways, and bridges in communities across the State and puts more dollars toward transit and safety. The Local Streets and Roads Program under SB-1 dedicates approximately $1.5 billion per year in new formula revenues to cities and counties for basic road maintenance, rehabilitation, and critical safety projects. These projects include repairing pavement, restriping lanes, bringing crosswalks and sidewalks up to code, and expanding bicycle and pedestrian access. The SB-1 funds are typically use d to augment funding from other sources.

Rebuilding American Infrastructure with Sustainability and Equity

In 2021, the US Department of Transportation announced the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Discretionary Grant opportunity. RAISE replaces the Better Utilizing Investments to Leverage Development (BUILD) Grant that began in 2018, which replaced the Transportation Investment Generating Economic Recovery (TIGER) Grant that began in 2009. Similar to BUILD and TIGER, RAISE targets transportation projects based on merit criteria that include safety, environmental sustainability, quality of life, economic competitiveness, state of good repair, innovation, partnership, and additional non-Federal revenue for infrastructure investments. Projects applying for RAISE funding should in particular, demonstrate improvements to racial and economic equity, reduce impacts of climate change, and create high-quality jobs.

While RAISE has no minimum award requirement for planning grants that fund pre-construction activities such as design, engineering, studies, and plans, the minimum award for capital projects is $5 million. For all projects, the maximum award amount is $25 million, and the federal cost share is up to 80%. RAISE funding cycles are expected to repeat annually, and applications for Cycle 1 were due in July 2021.

One Bay Area Grant

The MTC's One Bay Area Grant program (OBAG) is a funding approach that aligns the Commission's investments with support for focused growth. Established in 2012, OBAG taps federal funds to maintain MTC's commitments to regional transportation priorities while also advancing the Bay Area's land-use and housing goals. OBAG includes both a regional program and a county program that targets project investments in Priority Development Areas (PDAs) and rewards cities and counties that approve new housing construction and accept allocations through the Regional Housing Need Allocation (RHNA) process. The MTC recognizes Central Rohnert Park as a PDA and this project would directly serve current and future residents located within it.

The first round of OBAG (OBAG-1) guided $827 million in federal funds over the five year period from 2012-13 through 2016-17. In 2015, MTC adopted the second round of OBAG (OBAG-2) and revised its framework in 2016 to distribute additional revenues and incorporate additional housing-related program elements. OBAG-2 funding is projected to total roughly $916 million to fund projects from 2017-18 through 2021-22. The development of OBAG-3 is anticipated to begin in 2021. To ensure that this project is eligible to receive regional funding and indicate that it considers the accommodation of pedestrians, cyclists, public transit users and drivers as part of project planning, design, funding and construction, the City should complete and submit a Complete Streets Checklist to the MTC.

Transportation Development Act

Transportation Development Act (TDA) funds are generated from a statewide quarter-cent sales tax, and article 3 of the TDA (TDA-3) is a two-percent set-aside of those funds for bicycle and pedestrian planning and projects. To be eligible for funding, a project must be for the exclusive benefit of cyclists and pedestrians and included in a locally approved bicycle, pedestrian, transit, multimodal, complete streets, or other relevant plan and reviewed by a city or county Bicycle Advisory Committee. As discussed in the Project Background chapter of this Study, this project is included in the approved Sonoma County Bicycle and Pedestrian Master Plan as a "high" priority project, as well as a variety of other existing planning documents.

Active Transportation Program

Created by Senate Bill 99 and Assembly Bill 101, the Active Transportation Program (ATP) is a competitive statewide program that encourages increased use of active modes of transportation. Awarded projects must propose to achieve a variety of transportation, health and safety outcomes such as increased walking and biking, increased safety and mobility, reductions in GHG emissions, improved health outcomes, and direct benefits to disadvantaged communities.

The California Transportation Commission (CTC) issues a call for projects every two years for the ATP. For Cycle 5, which closed in September 2020, the CTC received 454 project nominations seeking approximately $2.3 billion in funds. In February 2021, CTC staff recommended 41 projects, including support for the State's Active Transportation Resource Center, totaling $241.5M in funding for the 2022-2025 fiscal years. The call for projects for ATP Cycle 6 is expected to be issued in March 2022, with additional funding from the IIJA. It is important to note that non-ATP funding committed to a project, or leveraged funding, is considered in the evaluation of projects for award.

Projects applying for ATP funding with the CTC can also apply for a regional award through the MTC, which provides an additional chance for funding, should a project not be recommended at the State level.

Sonoma County Measure M and Measure DD (Go Sonoma)

As discussed in the Project Description section, this Study is made possible by Measure M, the Sonoma County Traffic Relief Act, which has invested $14 million in Sonoma County bicycle and pedestrian projects. In November 2020, Sonoma County voters passed Measure DD, the Go Sonoma Act, which extends the Measure M sales tax funding for an additional 20 years with no increase in existing sales tax rates. Go Sonoma carries forward similar objectives as Measure M and puts more emphasis on smaller upgrades, including a greater share of funding for local roads, transit, bike, and pedestrian projects.

Prior to January 2024, SCTA will prepare a Strategic Plan with review by the SCTA advisory committees and approval by the SCTA Board. It will use funding prioritization criteria consistent with the goals and objectives of Moving Forward 2050, the Comprehensive Transportation Plan (CTP) and the Go Sonoma expenditure plan. The Strategic Plan will be updated every five years and include general procedures for project sponsors to initiate a project and identify an implementation schedule and the programming of funds based on successful calls for projects.

This project is included in the priority list for Go Sonoma's Build Bikeways and Pathways program, with funding subject to a competitive process. Projects scored by SCTA will be submitted to the SCTA Technical Advisory Committee (TAC) for review, evaluation and recommendation. The TAC's list of recommended projects will be sent to the SCTA and Regional Climate Protection Authority advisory committees for their review and recommendation to the SCTA Board who will make the final decision on funding for projects.

APPENDICES

A. PUBLIC AND STAKEHOLDER ENGAGEMENT

B. FUTURE DEMAND AND ACCESSIBILITY ASSESSMENT

C. CREEK CULVERTS HYDRAULIC STUDY

D. ALTERNATIVE OVERCROSSING ALIGNMENTS ASSESSMENT MATRIX

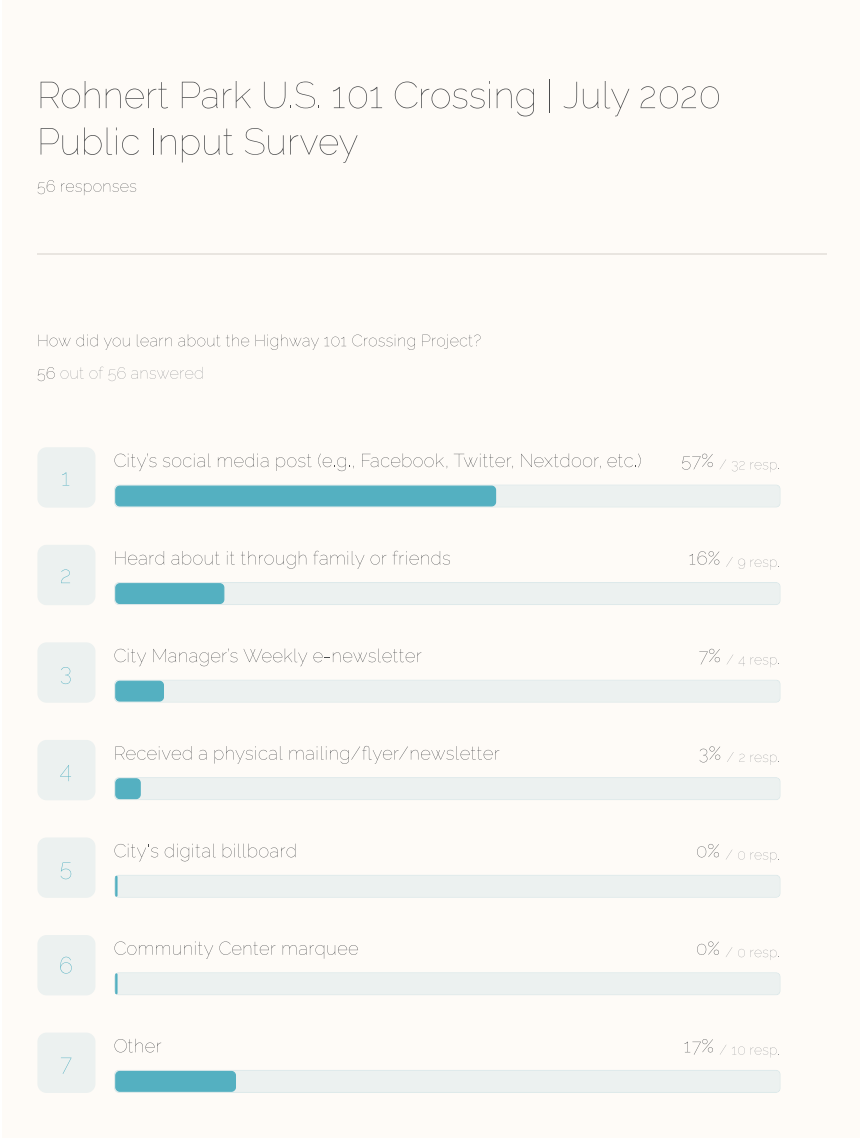
E. NEW CROSSWALK AT COMMERCE BOULEVARD ASSESSMENT

F. PRELIMINARY COST ESTIMATES

Rohnert Park Highway 101 Bike & Pedestrian Crossing Feasibility Study
Public and Stakeholder Engagement Chronology

1. **Public Input Survey**
    a. Survey period: June 26 - July 19, 2020
    b. Noticing via:
        i. City of Rohnert Park Website Home Page, Community Spotlight
        ii. City of Rohnert Park Facebook
        iii. City of Rohnert Park Nextdoor
        iv. City of Rohnert Park Twitter
        v. City of Rohnert Park Bicycle and Pedestrian e-Newsletter
2. **Early Coordination Meeting with Caltrans District 4**
    a. Tuesday, November 3, 2020, 2:00 PM
3. **Project Information Sheet**
    a. Posted on project website: Tuesday December 1, 2020
4. **Coordination Meetings with Sonoma Water**
    a. Monday, November 16, 2020, 1:00 PM
    b. Monday, March 8, 2021, 11:00 AM
    c. Monday, March 15, 2021, 3:00 PM
5. **Public Meeting with the Rohnert Park Bicycle and Pedestrian Advisory Committee**
    a. Monday, December 14, 2020, 5:30 PM
6. **Public Meeting with the Rohnert Park Planning Commission and Rohnert Park Bicycle and Pedestrian Advisory Committee**
    a. Thursday, March 25, 2021, 6:00 PM
7. **Online Public Workshop**
    a. Thursday, May 6, 2021, 6:00 PM
    b. Noticing via:
        i. Community Voice Newspaper
        ii. City of Rohnert Park Website Home Page, Community Spotlight
        iii. City of Rohnert Park Facebook
        iv. City of Rohnert Park Nextdoor
        v. City of Rohnert Park Twitter
        vi. City of Rohnert Park Bicycle and Pedestrian e-Newsletter
        vii. City of Rohnert Park Traffic Updates e-Newsletter
        viii. City of Rohnert Park April Senior e-Newsletter
        ix. City of Rohnert Park May Senior e-Newsletter
        x. City of Cotati Bike/Ped Planning
        xi. Sonoma County Bicycle Coalition Facebook
        xii. Sonoma State University Facebook
        xiii. Messaging at various affordable housing communities in the project area, including the Copeland Creek Senior Apartments, Altamont Senior Apartments, Rancho Feliz Mobile Home Park, Edgewood Apartments, and Muirfield Apartments
8. **Public Meeting with the Rohnert Park City Council**
    a. Tuesday, October 26, 2021, 5:00 PM

SGA Project No. 20-01 | Rohnert Park Project No. 2017-20



What is your age range?

56 out of 56 answered

1	60+ years	37% / 21 resp.
2	46-60 years	32% / 18 resp.
3	31-45 years	21% / 12 resp.
4	19-30 years	8% / 5 resp.
5	13-18 years	0% / 0 resp.
6	Under 13	0% / 0 resp.

How long have you lived in Rohnert Park?

56 out of 56 answered

1	11-25 years	28% / 16 resp.
2	More than 25 years	25% / 14 resp.
3	Less than 6 years	17% / 10 resp.
4	6-10 years	16% / 9 resp.
5	I do not live in Rohnert Park	12% / 7 resp.

Do you work in Rohnert Park?

56 out of 50 answered

1	Yes	33% / 19 resp.
2	No	66% / 37 resp.

Do you cycle outdoors?

56 out of 50 answered

1	Sometimes	44% / 25 resp.
2	Yes, often	44% / 25 resp.
3	No	10% / 6 resp.

Survey period: June 26 - July 19, 2020 4

Do you run, jog, or walk outdoors?

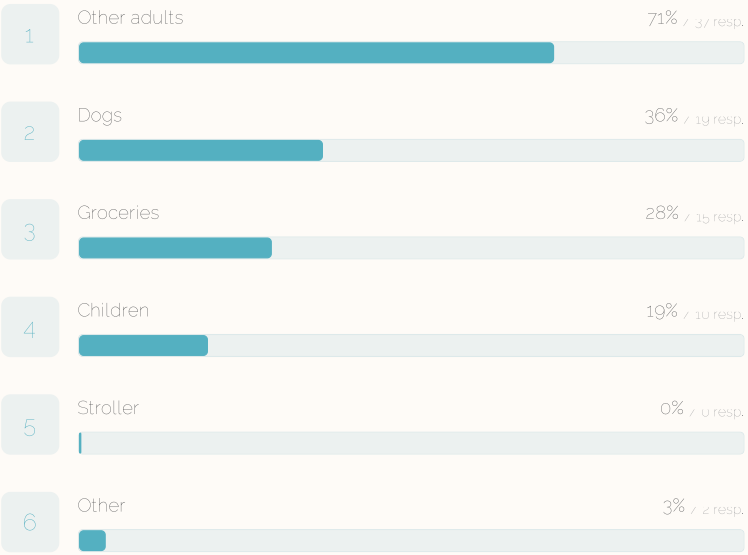
56 out of 50 answered

1	Yes, often	60% / 34 resp.
2	Sometimes	30% / 17 resp.
3	No	8% / 5 resp.

Survey period: June 26 - July 19, 2020 5

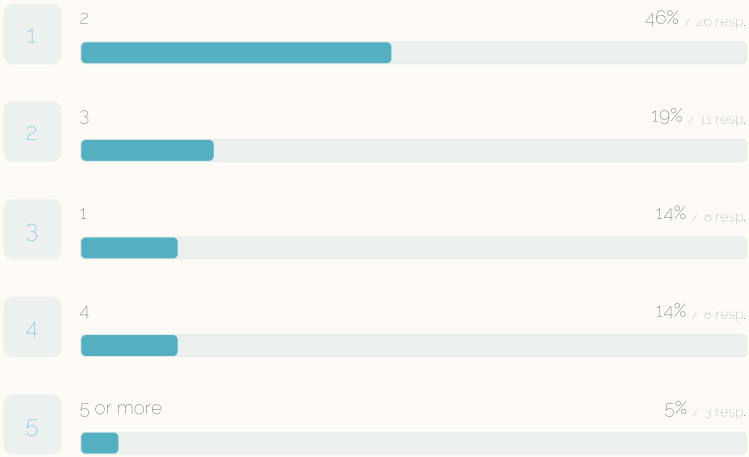
Do you cycle, run, or walk with any of the following?

52 out of 56 answered



Including yourself, how many people are in your household?

56 out of 56 answered



Including yourself, what age groups in your household walk or bike in Rohnert Park?

56 out of 56 answered

1	46-60 years	41% / 23 resp.
2	60+ years	32% / 18 resp.
3	31-45 years	26% / 15 resp.
4	19-30 years	12% / 7 resp.
5	Under 13	12% / 7 resp.
6	13-18 years	8% / 5 resp.
7	No one in my household walks or bikes in Rohnert Park	0% / 0 resp.

How important is it to you to improve bicycle and pedestrian connectivity between east and west sides of the U.S. 101 freeway in Rohnert Park?

56 out of 56 answered

1	A new U.S. 101 crossing for cyclists and pedestrians is an important key investment for Rohnert Park.	62% / 35 resp.
2	The necessity and importance of a new freeway crossing for cyclists and pedestrians is not yet clear.	19% / 11 resp.
3	Existing bicycle and pedestrian crossings of U.S. 101 are sufficient.	17% / 10 resp.

Please choose up to three statements below that best describe your personal priorities for a Highway 101 crossing for cyclists and pedestrians.

56 out of 56 answered

1. A new or improved crossing should be located and configured to minimize interactions with automobiles. 73% / 41 resp.

2. When I use a bicycle and pedestrian crossing, I should be able to clearly see other people around me and who I am approaching, and it should also be well-lit at night. 66% / 37 resp.

3. A new or improved crossing should be wide enough so that fast cyclists do not need to ride where pedestrians and other slower users are. 50% / 28 resp.

4. A new or improved crossing should be cost effective. 28% / 16 resp.

5. A new or improved crossing should have gentle slopes and curves and spots to rest. 17% / 10 resp.

6. A new or improved crossing should be implemented as soon as possible. 14% / 8 resp.

7. A crossing should be a landmark so that people driving along the freeway will be interested in stopping in Rohnert Park and using it. 12% / 7 resp.

8. Other 7% / 4 resp.

Which statement below best describes how you typically travel between east and west Rohnert Park?

56 out of 56 answered

1	I drive a car or motorcycle.	80% / 45 resp.
2	I bike.	17% / 10 resp.
3	I use a personal mobility device.	1% / 1 resp.
4	I skateboard or scooter.	0% / 0 resp.
5	I take Golden Gate Transit.	0% / 0 resp.
6	I take Sonoma County Transit.	0% / 0 resp.
7	I walk.	0% / 0 resp.
8	Other	0% / 0 resp.

Survey period: June 26 - July 19, 2020 12

Have you ever walked or biked over U.S. 101 using the Rohnert Park Expressway (RPX) overpass?

56 out of 56 answered

1	Once or a few times	50% / 28 resp.
2	Never	30% / 17 resp.
3	Yes, often	19% / 11 resp.

Survey period: June 26 - July 19, 2020 13

As someone who has walked or biked over U.S. 101 on RPX, which statement below do you agree with the most?

39 out of 50 answered

1. I would feel more comfortable using RPX if bike/ped improvements were made. 56% / 22 resp.
2. I feel comfortable using RPX, and no bike/ped improvements are needed. 23% / 9 resp.
3. No amount of bike/ped improvements would make me want to walk or bike along RPX again. 20% / 8 resp.

As someone who has never walked or biked over U.S. 101 on RPX, which statement below do you agree with the most?

17 out of 50 answered

1. I would use RPX if bike/ped improvements were made. 58% / 10 resp.
2. No amount of bike/ped improvements would make me want to walk or bike along RPX. 41% / 7 resp.
3. Although I haven't used RPX, I would feel comfortable with it, and no bike/ped improvements are needed. 0% / 0 resp.

Have you ever walked or biked through the Golf Course Drive underpass?

56 out of 56 answered

1 Never 50% / 28 resp.

2 Once or a few times 30% / 17 resp.

3 Yes, often 19% / 11 resp.

Survey period: June 26 - July 19, 2020 16

As someone who has walked or biked through the Golf Course Drive underpass, which statement below do you agree with the most?

28 out of 56 answered

1 I would feel more comfortable using the underpass if bike/ped improvements were made. 60% / 17 resp.

2 I feel comfortable using the underpass, and no bike/ped improvements are needed. 25% / 7 resp.

3 No amount of bike/ped improvements would make me want to walk or bike through the underpass again. 14% / 4 resp.

Survey period: June 26 - July 19, 2020 17

As someone who has never walked or biked through the Golf Course Drive underpass, which statement below do you agree with the most?

28 out of 50 answered

1. I would use the underpass if bike/ped improvements were made. — 64% / 18 resp.
2. Although I haven't used the underpass, I would feel comfortable with it, and no bike/ped improvements are needed. — 17% / 5 resp.
3. No amount of bike/ped improvements would make me want to walk or bike through the underpass. — 17% / 5 resp.

Have you ever walked or biked under U.S. 101 along the creeks?

56 out of 56 answered

1. Never — 57% / 32 resp.
2. Yes, at both Copeland Creek and Hinebaugh Creek — 28% / 10 resp.
3. Yes, at Copeland Creek — 12% / / resp.
4. Yes, at Hinebaugh Creek — 1% / 1 resp.

As someone who has walked or biked under U.S. 101 along the creeks, which statement below do you agree with the most?

24 out of 50 answered

1. I would feel more comfortable using the creeks if bike/ped improvements were made. 75% / 18 resp.
2. No amount of bike/ped improvements would make me want to walk or bike under U.S. 101 along the creeks again. 16% / 4 resp.
3. I feel comfortable using the creeks, and no bike/ped improvements are needed. 8% / 2 resp.

Survey period: June 26 - July 19, 2020 20

As someone who has never walked or biked under U.S. 101 along the creeks, which statement below do you agree with the most?

32 out of 50 answered

1. I would use the creeks if bike/ped improvements were made. 78% / 25 resp.
2. Although I haven't used the creeks, I would feel comfortable with it, and no bike/ped improvements are needed. 12% / 4 resp.
3. No amount of bike/ped improvements would make me want to walk or bike under U.S. 101 along the creeks. 9% / 3 resp.

Survey period: June 26 - July 19, 2020 21

If there was a new Highway 101 crossing for cyclists and pedestrians, choose up to three destinations you would walk or bike to on the east side of the freeway.

56 out of 56 answered

1	Rohnert Park-Cotati Regional Library	35% / 20 resp.
2	Safeway and Raley's Shopping Area	35% / 20 resp.
3	SMART Station and multi-use pathway	35% / 20 resp.
4	Sonoma State University and Green Music Center	23% / 13 resp.
5	Commerce Blvd and State Farm Drive Business and Industrial Area	21% / 12 resp.
6	Crane Creek Regional Park	21% / 12 resp.
7	Rohnert Park Community Center and Performing Arts Center	19% / 11 resp.
8	Kaiser Medical Offices	12% / 7 resp.
9	Rogers Plaza and DoubleTree Hotel Area	12% / 7 resp.

10	Padre Town Center Banking Area	7% / 4 resp.
11	Park and Ride	5% / 3 resp.
12	School (elementary, middle, high, etc.)	5% / 3 resp.
13	City Hall	3% / 2 resp.
14	Other	12% / 7 resp.

If there was a new Highway 101 crossing for cyclists and pedestrians, choose up to three destinations you would walk or bike to on the west side of the freeway.

56 out of 56 answered

1	Target and Movie Theater Shopping Area	67% / 38 resp.
2	Laguna de Santa Rosa Creek Trail	44% / 25 resp.
3	Home Depot and Walmart Shopping Area	41% / 23 resp.
4	Costco and Carlson Business Area	39% / 22 resp.
5	Graton Resort and Casino	8% / 5 resp.
6	Park and Ride	7% / 4 resp.
7	Scandia	7% / 4 resp.
8	School (elementary, middle, high, etc.)	0% / 0 resp.
9	Other	8% / 5 resp.

Survey period: June 26 - July 19, 2020 24

Would you be able to attend an online public meeting for the project in August or September?

56 out of 56 answered

1	Yes, I am available in both August and September	53% / 30 resp.
2	No, I will not be available	28% / 16 resp.
3	Yes, in August	8% / 5 resp.
4	Yes, in September	8% / 5 resp.

Would you like to provide any additional comments or ideas?

56 out of 56 answered

1	Yes	21% / 12 resp.
2	No	78% / 44 resp.

Survey period: June 26 - July 19, 2020 25

In a few keywords or phrases, how would you describe Rohnert Park?

- bedroom community
- Bike friendly
- Blue-collar neighborhoods with no downtown area
- Nice small town
- Needs more paved bicycle paths
- A close place for me to shop and bank.
- Homes, students, the basics, but lacks soul.
- growing
- Great place to live. Safe.
- Friendly and well planned out.
- Community. Parks.
- Boring, divided, poorly governed.
- a place i enjoy living in
- Friendly and safe.
- Dog friendly, parking scarce.
- Suburban, quiet
- Nice, clean, friendly, medium-small City
- Centerless bedroom community
- Development-happy in ways that will ruin us.
- Typical suburban
- Relatively clean and safe.
- nice original plan; friendly people; I worry about too many bicyclists; would like parking permits on michael way
- Spread out, no center
- Disconnected
- Normal
- very nice, getting congested, over developed
- Very planned looking, a downtown RP doesn't exist
- suburb devoted to auto traffic
- A friendly city
- nice
- Evolving as a real City but needs a downtown!
- Mostly pleasant
- Family friendly
- A quiet community
- More residences than "City"
- Car-oriented
- sterile. no center. car-oriented, despite the presence of many bike paths
- Family community now riddled by homelessness, crime and lack of maintenance
- Unkept, dirty paths with over grown vegetation
- Ok, could be better
- Neighborly
- a friendly city. Business in one area, homes in another.
- Wonderful Place to Live
- love all the creek trails!
- Nice
- Nice small town. I like that it isn't as large as Petaluma or Santa Rosa.
- Nice place to live with nature woven in which is lovely. I like my neighborhood
- Gross
- Youth sports, family, working class
- hometown
- Friendly, easy going community
- Peaceful and a nice place to live
- pleasant, accessible, friendly sometimes

Please share any additional comments or ideas below.

- The bike lanes are not contiguous which puts us bicyclists in danger frequently. It is not just about painted lines. People drive fast in RP and there are no reminders about sharing the road anywhere.
- What under freeway creek pedestrian / cycling crossings are you talking about. These don't exist, do they?
- We need the city council in RP be replaced. They seem to have their priorities wrong. Self serving without looking at what really needs to be addressed, like constant utility cost increases and crumbling infrastructure.
- At this point with the city's inability to maintain the present road's and path's in rohnert park I don't think we need to improve any single use things such as this
- Hinebaugh/Crane Creek/Five Creek paths between E, S sections, the apartments and mobile home park on Snyder Lane have been in poor condition for several years. Please repair the paths in place before adding additional infrastructure, lest they fall victim to a similar fate.
- I am concerned that there does appear to be a clear goal in increasing East/West connectivity via bike paths. We have high rates of congestion at the RPX and Country Club/101 entrance already. I would rather see this money going to better maintaining the public parks and trails that are regularly used by residents.
- There are biking connections with Stony Point Rd via W Copeland Trail. There is a potential walking trail on the SW side of Laguna da Santa Rosa (Sonoma Water access rd), and a bridge could connect to this.
- this has never been an issue before. Please remember rp didn't want a smart train stop while we have the casino. If you expand pedestrian and cyclist accessibility, it doesn't mean families are going to use them....other members of society will. Rp is a family town, not a downtown Santa rosa hub.
- I ride my bicycle several times a week to the other side of the freeway, and it is very dangerous. Cars turning right going eastbound on Golf Course Drive on to the Northbound Hwy 101 on Ramp do not stop or check for pedestrians going across commerce blvd. Almost got hit here a couple of times. Also after the widening of Golf Course Drive to add more turn lanes, the bike lane was eliminated. Crossing at RPX is difficult too because of Narrow Sidewalks with extra high curbs so an bicycle and pedestrian cannot pass on the sidewalk, and many on /off ramps to cross with traffic turning on them. Riding bicycles on the roadway with traffic is dangerous because of visibility issues caused by the elevation of the roadway as it crosses the freeway,
- We need to keep adding more bicycle lanes around the city to keep bicyclists safe from car traffic. Keep up the good work.
- I am unaware of the creek crossings. Also, it isn't always about the crossings themselves, but may be about the intersections and side walks on either side.
- City Council members should bike on the trails. They would see that they vary in how bumpy they are, how safe they are, if they suddenly disappear, and the difficulty of making left turns (when lights are not tripped by bicycles).

ROHNERT PARK
HIGHWAY 101 BIKE AND PEDESTRIAN CROSSINGS
FEASIBILITY STUDY

Caltrans Early Coordination Meeting - Notes
Tuesday, November 3, 2020, 2:00 PM
Online Meeting - Webex

1. The purpose of the meeting was to inform Caltrans about the project and gather information that would help assist the City of Rohnert Park assess the feasibility of improvements to existing crossings of US 101 or new bike/ped crossings.
2. Steven Grover (SG), of SGA, opened the meeting with a presentation that included an overview of the project's purpose and need and a preliminary assessment of potential US 101 bike/ped crossing locations and alignments in Rohnert Park. The presentation concluded with questions on four topics for which the consultant team requested discussion with and input from Caltrans:
    a. Feasibility of using existing culverts for a bike/ped undercrossing
    b. Caltrans' future US 101 plans/projects in Rohnert Park
    c. Known constraints that rule out supports within state Right of Way
    d. Feasibility of non-structural modifications to existing overcrossing structures
3. Using Existing Culverts for a Bike/Ped Undercrossing
    a. SG stated that all potential new crossing locations along the US 101 corridor in Rohnert Park have been studied, and a consensus has been reached with City staff that the two creek locations are best for further study and that using the existing culverts for an undercrossing has not yet been ruled out. On behalf of Rohnert Park, SG requested that Caltrans assess hydraulic capacity of both culverts and compare it to the measured flow rate for the two creeks to assist in a feasibility assessment of whether bike/ped features can be added.
        i. Lilian Acorda (LA), of Caltrans Project Management, replied that Caltrans would be able to respond to this request.
    b. SG stated that although we are aware that undercrossings are not preferable, the culverts exist and are currently being used by people to cross US 101, so redeveloping them would provide a quicker and less expensive bike/ped crossing, as compared to a new overcrossing.
    c. Halim Mathkour (HM), of Caltrans Design, noted that flooding would limit the time that an undercrossing could be used and that bike/ped advocacy groups might have stong opinions about limited use, safety, and sudden flooding. LA also observed that the bike path would be seasonal due to the flooding. HM believed that the design and hydraulics of the culverts would need to be researched to determine if any modifications could be made.

        i. Bindu Samudrala (BS), of Caltrans Hydraulics, concurred with HM that Caltrans will have to conduct research about the culverts before providing more information about hydraulics.
        ii. According to Jimmy Darling, of SGA, the as-built drawings of the culverts are dated:
            1. Hinebaugh Creek culvert (Bridge #20-0082) at PM 14.027: 1969, 2003
            2. Copeland Creek culvert (Bridge #20-0015) at PM 13.516: 1955, 1978, 2009
    d. HM observed that the photos of flooding do not appear to show any freeboard, which is usually around three feet, and which new structures are required to accommodate, since water should not typically reach the soffit of the structures.
        i. SG stated that it is unknown if flooding is due to the hydraulic capacity of the culverts or due to unmaintained creek channels and obstruction of the culverts by debris.
        ii. Gordon Sweet (GS), of BKF Engineers, added that flooding could also be due to storm events, which cause flooding that exceeds the culverts' design requirements.
        iii. Vanessa Garrett (VG), of Rohnert Park, observed that although the creeks appear to flood annually, the water drains fairly quickly, typically taking less than a day. VG recalled that there might have been one flood occurrence in 2019, but a few in 2016.
    e. According to HM, Caltrans Maintenance has units that are responsible for maintaining various drainage systems and should have records of who is responsible for Rohnert Park's US 101 culverts.
        i. VG noted that that City might own the creek portion upstream of the culvert and that Sonoma Water owns the downstream portion. VG added that when the City and consultants meet with Sonoma Water in the future, the frequency of creek maintenance will be discussed.
        ii. HM stated that Caltrans typically maintains culverts within State right-of-way.
        iii. GS pointed out that a similar undercrossing concept was completed in District 5 along San Lorenzo River in Santa Cruz, so a precedent does exist, and agreements between agencies including Caltrans and the City would be required.
    f. Gregory Currey (GC), of Caltrans Bike/Ped, stated that although cyclists and pedestrians don't prefer to use undercrossings due to lighting issues and safety concerns, which can be addressed by design, there is no Caltrans policy that discourages undercrossings.
        i. LA observed there have not been many recent bike/ped undercrossing projects, but given the undercrossing project in District 5 mentioned by

GS, it might depend on location. LA added that safety concerns remain a big issue during first impressions of undercrossings, regardless of how well they are illuminated. LA believed that in contrast, overcrossings that are above traffic offer better visibility of users.

ii. SG observed that if an overcrossing is developed at the creek locations, the culvert would remain open due to the need for water flow and will likely be used by people seeking a shorter route to cross US 101. SG added that an overcrossing may also reinforce encampments due to additional overhead structures that create sheltered spaces.

1. VG noted that the situation would be similar to existing conditions and that the design of an overcrossing would have to make sure the majority of people would prefer to use the overcrossing. VG added that the creeks typically attract transients, who definitely use the culverts today.
2. Eydie Tacata, of Rohnert Park, observed that there are already encampments on the west side of Copeland Creek.

g. According to GS, since this segment of US 101 is tied to recent HOV gap closure projects, there may be drainage and/or hydraulic reports in which the culverts would be studied. Therefore, SCTA (Seana or James) might have relevant information.

i. Jonathan Lee (JL), of Caltrans Design, stated that Caltrans might have the hydraulic reports for Hinebaugh Creek, since the HOV project between Rohnert Park Expressway and Santa Rosa Avenue was done in-house, while SCTA did the project south of Rohnert Park Expressway.

4. <u>Future Plans or Projects along US 101 in Rohnert Park</u>
   a. Mimy Hew, of Caltrans Advance Planning, has not received any requests to work on projects along the US 101 corridor in the project area.
   b. According to Kang Tang (KT), of Caltrans Advance Planning, two US 101 pavement projects are planned in the area, which are not anticipated to impact striping, lanes, or structures. However, KT noted that the projects are in the later years of the 10-year plan, so they might change over time. Additionally, there is an overcrossing project near Santa Rosa Avenue, beyond the project area.
   c. LA was also not aware of other improvements in the project area, and the HOV project is the last remaining project in the area being completed. Since there are already HOV lanes through Rohnert Park, the current HOV and widening project along US 101 around Petaluma would not extend to Rohnert Park.
   d. According to LA, Caltrans was also not aware of the Business Park Drive/State Farm Drive overcrossing project that Rohnert Park had planned in the past and intends to pursue in the future. LA believed that since the project only connects local east-west roads, the project would not result in major issues or impacts to US 101.

5. <u>Supports in State Right-of-Way and Potential Constraints</u>
   a. According to Solomon Tesfe, of Caltrans Design, an overcrossing with supports in State right-of-way may require design exceptions, such as nine-foot shoulders, since the standard shoulders on US 101 should be 10 feet. However, Caltrans Design would be able to look into any proposed non-standard designs and determine if they would be acceptable.
6. <u>Non-Structural Modifications to Existing US 101 Structures</u>
   a. JL, who was involved in the in-house design of the Golf Course Drive undercrossing, recalled that the space behind the columns was being considered for possible future use for vehicular traffic. JL added that although there are no planned projects at this time, the option was included should additional capacity be needed in the future.
      i. SG confirmed that a preliminary traffic assessment would be conducted for this feasibility study.
   b. Chris Master (CM), of Caltrans Encroachment, stated that if any work is done to the undercrossing, a maintenance agreement would be required, which would take some time. CM did not foresee that artistic treatments, such as paint that does not impact traffic above, would be an issue. CM added that Maintenance would know more, and that the City would take over maintaining the structure from Caltrans, should such changes be made.
      i. GC added that Caltrans HQ might occasionally be sensitive to any modifications to structures in State right-of-way, including what may seem like relatively benign elements such as paint, so the team should be aware that.
7. Next Steps
   a. City and Consultants
      i. Contact SCTA to obtain the hydraulic report for the Copeland Creek culvert (and Hinebaugh Creek culvert, if available), which was likely included in the US 101 HOV lanes project. Also see if SCTA has documents about the Golf Course Drive undercrossing as part of Measure M Highway 101 Project #1 - Wilfred, which would provide information about the space behind the columns.
         1. If SCTA does not have hydraulic reports or information about Golf Course Drive, contact JL and BS at Caltrans.
      ii. Meet with Sonoma Water to determine creek maintenance responsibilities, frequency, constraints, etc.
   b. Caltrans
      i. If necessary, pending information from SCTA, provide hydraulic report for the Hinebaugh Creek culvert (and Copeland Creek culvert, if available), which was likely included in the US 101 HOV lanes project.

ii. If necessary, pending information from SCTA, provide documents about the Golf Course Drive undercrossing, which would include information about the space behind the columns.
iii. If necessary, pending information included in the hydraulic reports, research the capacity of the Hinebaugh Creek and Copeland Creek culverts, the creeks' water flow and flood data, and assist in assessing the feasibility of adding bike/ped features to the culverts.

8. Attendees
   a. Caltrans
      i. Lilian Acorda, Project Management, lilian.a.acorda@dot.ca.gov
      ii. Gregory Currey, Bike/Ped, Gregory.Currey@dot.ca.gov
      iii. Mimy Hew, Advance Planning, mimy.hew@dot.ca.gov
      iv. Josephine Hsai, System Planning, Josephine.Hsai@dot.ca.gov
      v. Jonathan Lee, Design, jonathan.c.lee@dot.ca.gov
      vi. Chris Master, Encroachment, chris.master@dot.ca.gov
      vii. Halim Mathkour, Design, halim.mathkour@dot.ca.gov
      viii. Himabindu Samudrala, Hydraulics, Himabindu.Samudrala@dot.ca.gov
      ix. Kang Tang, Advance Planning
      x. Solomon Tesfe, Design, solomon.tesfe@dot.ca.gov
   b. Rohnert Park
      i. Vanessa Garrett, VMarin@rpcity.org
      ii. Jason Sampietro, jsampietro@rpcity.org
      iii. Jeff Beiswenger, JBeiswenger@rpcity.org
      iv. Eydie Tacata, etacata@rpcity.org
   c. BKF Engineers
      i. Gordon Sweet, GSweet@bkf.com
   d. Steven Grover & Associates
      i. Steven Grover, sgn@stevengrover.com
      ii. Oscar Tsai, oscar@stevengrover.com
      iii. Jimmy Darling, jimmy@stevengrover.com

9. Additional Information
   a. Commerce Blvd viaduct/undercrossing of US 101 at PM 15.027 (Bridge #20-0287)
   b. Golf Course Dr undercrossing of US 101 at PM 14.9 (Bridge #20-0286
   c. Rohnert Park Expressway overcrossing of US 101 at PM 13.879 (Bridge #20-0235)

http://bit.ly/RohnertPark101BikePedCrossing

measure M sales tax at Work

Rohnert Park HIGHWAY 101 BIKE & PEDESTRIAN CROSSING

PROJECT INFORMATION

The US 101 freeway is a major barrier to east-west travel in central Rohnert Park, particularly for cyclists and pedestrians, and creates gaps in the City's active transportation network. The undercrossings at Commerce Boulevard and Golf Course Drive, as well as the Rohnert Park Expressway overcrossing, do allow for travel between the east and west sides. However, these crossings, while functional, present safety concerns by requiring cyclists and pedestrians to navigate freeway on and off ramps and large intersections.

To improve bicycle and pedestrian safety and circulation, the City is developing a **Feasibility Study** of bicycle and pedestrian crossings of US 101. The Study will evaluate potential crossing locations and alignments, and recommend a community-preferred alignment and configuration. The bike/ped crossing project would provide pedestrians and cyclists with a safer alternative for crossing US 101 in the vicinity of transit, businesses, and offices, and provide a continuous ADA-compliant Class I path to improve east-west connectivity and connect to the existing bike/ped network.

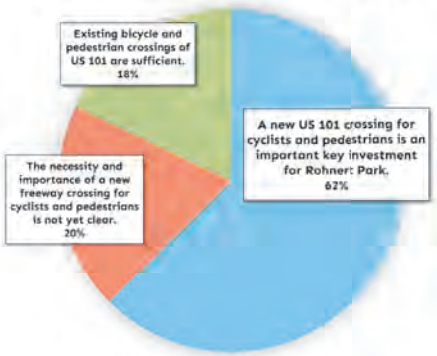
VEHICLE COLLISION HISTORY WITH CYCLISTS AND PEDESTRIANS

Data from the Transportation Injury Mapping System shows that 69 collisions occurred between 2008 and 2019 involving vehicles with cyclists and pedestrians in the central business district in the vicinity of US 101. Of those 69 collisions, one was fatal and 27 resulted in severe or visible injuries. The largest number of collisions (24) occurred within 0.25 miles of the Rohnert Park Expressway freeway crossing.[1] Additionally, 11 collisions occurred within 0.25 miles of the Golf Course Drive crossing.[2]

[1] 16 occurred at the intersections of Rohnert Park Expy. with Redwood Dr. and Commerce Blvd.
[2] Five occurred at the intersections of Golf Course Dr. with Redwood Dr. and Commerce Blvd.

PUBLIC INPUT SURVEY RESULTS

How important is it to you to improve bicycle and pedestrian connectivity between the east and west sides of US 101 in Rohnert Park?



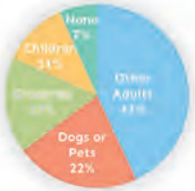
Top Three Personal Priorities for a Highway 101 Bike/Ped Crossing

1. A new or improved crossing should be located and configured to minimize interactions with automobiles. (73%)
2. When I use a bicycle and pedestrian crossing, I should be able to clearly see other people around me and who I am approaching, and it should also be well-lit at night. (66%)
3. A new or improved crossing should be wide enough so that fast cyclists do not need to ride where pedestrians and other slower users are. (50%)

Do you walk, jog, or run outdoors?

Do you cycle outdoors?

Do you cycle, walk, or jog with any of the following?



Top Destinations for Pedestrians and Cyclists

West Side of US 101

1. Target and Movie Theatre Shopping Area (67%)
2. Laguna de Santa Rosa Creek Trail (44%)
3. Home Depot and Walmart Shopping Area (41%)
4. Costco and Carlson Avenue Business Area (39%)
5. Graton Resort and Casino (8%)

East Side of US 101

1. Rohnert Park-Cotati Regional Library (35%)
2. Safeway and Raley's Shopping Area (35%)
3. SMART Station and multi-use pathway (35%)
4. Sonoma State University and Green Music Center (23%)
5. Commerce Blvd and State Farm Drive Business and Industrial Area (21%)
6. Crane Creek Regional Park (21%)
7. Rohnert Park Community Center and Performing Arts Center (19%)

2 of 4

PUBLIC INPUT SURVEY RESULTS CONTINUED

In a few key words or phrases, how would you describe Rohnert Park?

EXISTING US 101 CROSSINGS

Golf Course Drive Undercrossing

Rohnert Park Expressway Overcrossing

KEY DATES

April 2021:	Final Feasibility Report (Anticipated)
March 2021:	City Council Meeting (Anticipated)
	Second Public Meeting (Anticipated)
December 2020:	First Public Meeting with Bike/Ped Advisory Committee (Anticipated)
July 2020:	Public Input Survey

3 of 4

PRELIMINARY ASSESSMENT OF SEVEN POTENTIAL CROSSING LOCATIONS

1. Golf Course Drive

- Space behind columns provides a good opportunity for incremental bike/ped improvements.
- Large intersections will remain challenging for bike/ped travel.

➢ **Recommend study of incremental improvements & Class IV lanes.**

3. Industrial Park

- Does not connect directly to crosswalks across Redwood Drive and Commerce Boulevard or east-west bike/ped routes.

➢ **Exclude from further study**

5. Rohnert Park Expressway

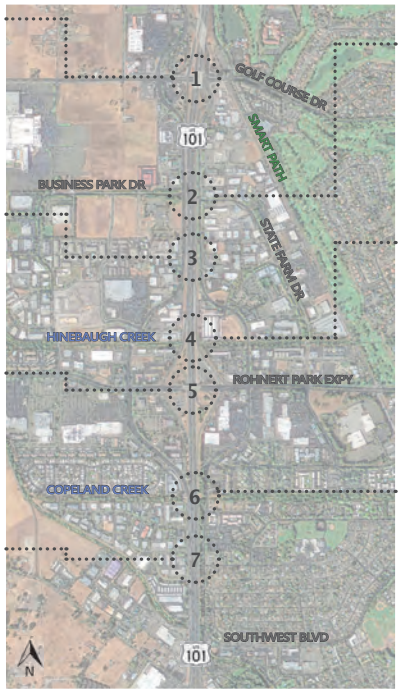
- Located at commercial center but large and many high-volume intersections will remain challenging for bike/ped travel.

➢ **Study possible incremental improvements**

7. Cotati/Neighborhood-A

- Does not connect to east-west bike/ped routes on the west (Cotati) side, and private ROW acquisition and roadway reconfiguration may be required.

➢ **Exclude from further study**



2. Business Park/State Farm

- Near business parks and Graton Resort but future vehicular overcrossing planned in this location will include bike/ped facilities.

➢ **No recommended improvements at this time.**

4. Hinebaugh Creek

- Near the commercial center and connects directly to east-west creek trails.
- Existing culverts are occasionally used informally to cross under US 101 and provide opportunities for improvement.

➢ **Study both undercrossing & overcrossing alternatives.**

6. Copeland Creek

- Near commercial center and connects directly to east-west creek trails.
- Existing culverts are informally used to cross under US 101 and provide opportunities for improvement.

➢ **Study both undercrossing & overcrossing alternatives.**

Hinebaugh Creek Trail

Copeland Creek Trail

The City is in the process of improving and upgrading the creek trails.

4 of 4

STEVEN GROVER & ASSOCIATES ARCHITECTURE ENGINEERING

Rohnert Park

ROHNERT PARK
HIGHWAY 101 BIKE AND PEDESTRIAN CROSSINGS
FEASIBILITY STUDY

Sonoma Water Coordination Meeting - Notes
Monday, March 8, 2021, 11:00 AM
Online Meeting - Zoom

1. The purpose of the meeting was to update Sonoma Water (SCWA) about Rohnert Park's US 101 Bike/Ped Crossing Feasibility Study and review conceptual design alternatives located at Copeland Creek.
    a. Kevin Booker (KB), of SCWA, stated that Jon Niehaus (JN) of SCWA's Stream Maintenance Program is unable to attend the meeting, but wanted to remind us that structures cannot block stream maintenance activities and access.
    b. KB and SGA agreed that a follow-up meeting with JN would be helpful, after JN has had an opportunity to review the slides and drawings.
2. Review of Conceptual Design Alternatives
    a. Steven Grover (SG), of SGA, provided a brief overview of the project and stated that the Copeland Creek location has been identified as the preferred crossing location. Assessments of the existing culvert under US 101 and hydraulics reveal that the culvert does not satisfy State geometric guidelines for vertical clearance for bike/ped undercrossings and that the existing creek channel and culvert are not large enough to contain the 100-year flow, which exceeds the top-of-bank elevation by as much as 2.7 feet. Therefore, an undercrossing at Copeland Creek has been ruled out and a new overcrossing is being studied further.
    b. SG reviewed five overcrossing alignment variations.
        i. Alternative A1 assumes a curved steel structure over US 101 with cast-in-place concrete approaches. The curving west side approach crosses the creek three times and touches down on the north side of the creek at Redwood Drive. The spiral east side approach crosses the creek once and touches down on the north side of the creek in the space between US 101 and Commerce Boulevard.
            1. Alternative A2 is nearly identical to A1, but assumes steel approaches.
        ii. Alternative B assumes a curved steel structure over US 101, with cast-in-place concrete approaches. The curving west side approach crosses the creek twice and touches down on the north side of the creek at Redwood Drive. The curving east side approach crosses the creek once and touches down at Avram Avenue, approximately 200 feet south of the creek.

SGA Project No. 20-01 | Rohnert Park Project No. 2017-20 1

iii. Alternative C1 assumes a straight concrete box structure over US 101, with cast-in-place concrete approaches. The U-shaped west side approach crosses the creek once and touches down on the north side of the creek at Redwood Drive. The spiral east side approach crosses the creek once and touches down on the north side of the creek in the space between US 101 and Commerce Boulevard.
    1. Alternative C2 is similar to C1, but the U-shaped west side approach crosses the creek once and touches down on the *south side* of the creek at Redwood Drive. The circular east side approach *does not* cross the creek and touches down on the north side of the creek in the space between US 101 and Commerce Boulevard.

iv. KB stated that JN would need to clarify what kind of maintenance work SCWA does in the area of the alternatives, how often, and what type of vehicles need to pass through.
    1. SGA stated that it would be able to cut sections with dimensions for review.

c. SG also reviewed the culvert extensions proposed as part of the project to widen the sidewalks and roadway along Redwood Drive and Commerce Boulevard, which would provide safer bike/ped facilities and a shoulder for vehicles.
    i. KB did not foresee any issues for SCWA with extending the culverts westward from Redwood Drive or westward from Commerce Boulevard, but added that the main question will be who is responsible for the extension.

d. SG asked if SCWA foresees any issues with construction over the creek during the construction phase, with the use of falsework or cast-in-place concrete, or any other issues pertaining to environmental processes.
    i. KB stated that JN would know better, as well as Keenan Foster, of SCWA's environmental group, who should be invited to the next meeting.

e. John Monaghan (JM), of SCWA, stated that there would be more right-of-way impacts for SCWA on the west side of US 101, since they own that area of the creek.
    i. SG clarified that there are more supports near the top of bank on the west side of US 101 than on the east side, but the hydraulics are less constrained on the west side. On the east side, the impacts are within Caltrans property, between US 101 and Commerce Boulevard, and SCWA does not appear to have formal maintenance access.
        1. KB stated that JN should clarify whether SCWA conducts any maintenance in the area between US 101 and Commerce Boulevard.

        2. Gordon Sweet (GS), of BKF Engineers, stated that Caltrans might have plans to relinquish these portions of right-of-way to the City and will check.
            a. *GS confirmed that per Alice Zhong, Caltrans Relinquishment Coordinator, the State has no plan to relinquish the parcels adjacent to Redwood Drive and Commerce Boulevard at this moment.*

    ii. JM asked if any additional right-of-way will be acquired to provide maintenance access.
        1. SG stated that the project does not anticipate acquiring right-of-way, since the alignment of the existing maintenance road would not change and the project could provide adequate vertical and horizontal clearance for maintenance vehicles.

    iii. JM stated that due to the approach on retaining wall between the maintenance road and the creek for Alternatives C1 and C2, SCWA loses the ability to access the creek from the top of bank, which would be a significant change.
        1. KB stated that JN would be able to provide more information.

f. Oscar Tsai (OT), of SGA, asked if SCWA needs to access the north side maintenance road by turning left from southbound Commerce Boulevard. SG added that since a new at-grade crossing and signal is proposed for this location, the design team wants to ensure that access to the road is not hindered by new poles. OT stated that a slide will be included that clarifies the question for JN.

3. Questions for SCWA
    a. Does SCWA maintain Copeland Creek in the area between US 101 and Commerce Boulevard?
        i. If so, what access is required?
    b. What vertical clearance is required above SCWA's maintenance roads for trucks and equipment?
    c. What horizontal clearance between obstructions is required along SCWA's maintenance roads for trucks and equipment?
    d. Does SCWA require continuous access to the creek from the top of bank?
    e. Do the vertical and horizontal clearances for SCWA's maintenance roads apply to both the north and south sides of the creek?
    f. We understand SCWA has ownership, in fee, of the Copeland Creek channel on the west side of US 101, but Caltrans' 2013 right-of-way map does not reflect this. Would SCWA please confirm the ownership and limits?
    g. Does SCWA need to access the Copeland Creek maintenance road from southbound Commerce Boulevard?

4. Action Items
    a. Sonoma Water
        i. (Completed) Provide available times for the follow-up meeting.
        ii. Review graphics and drawings and respond to key questions.
    b. BKF Engineers
        i. (Completed) Inquire with Caltrans whether right-of-way adjacent to Redwood Drive and Commerce Boulevard might be relinquished to the City.
    c. SGA
        i. (Completed) Share a copy of the presentation slides with cross sections and include key questions for SCWA.
5. Attendees
    a. Sonoma Water
        i. Kevin Booker, Principal Engineer, kevin.booker@scwa.ca.gov
        ii. John Monaghan, john.monaghan@scwa.ca.gov
    b. BKF Engineers
        i. Gordon Sweet, gsweet@bkf.com
    c. Steven Grover & Associates
        i. Steven Grover, sgn@stevengrover.com
        ii. Oscar Tsai, oscar@stevengrover.com
        iii. Jimmy Darling, jimmy@stevengrover.com
        iv. Chenyu Huang, chenyu@stevengrover.com

ROHNERT PARK
HIGHWAY 101 BIKE AND PEDESTRIAN CROSSINGS
FEASIBILITY STUDY

Sonoma Water Coordination Meeting - Notes
Monday, March 15, 2021, 3:00 PM
Online Meeting - Zoom

1. The purpose of the meeting was to follow up with Sonoma Water (SCWA) about Rohnert Park's US 101 Bike/Ped Crossing Feasibility Study and review conceptual design alternatives located at Copeland Creek.
2. Steven Grover (SG), of SGA, asked Keenan Foster (KF), of SCWA Environmental Resources, whether SCWA forsees any environmental permit and challenges with the project over the creek.
    a. KF asked for clarification of where support columns would be located in relationship to the top of bank.
    b. SG stated that on the east side, the columns are close to top of bank, and on the west side, the columns will be as close to top of bank as possible, but are not above it.
    c. KF stated that at that elevation, the project could be out of the jurisdiction of the Army Cops of Engineers (ACE), but this could be debatable with the California State Water Resources Control Board (SWB). Both the SWB and California Department of Fish and Wildlife (CDFW) will have concerns about tree removal as part of the project, in addition to potential habitat loss and shading, but KF does not believe these issues would render the project infeasible, since many of the creek functions would still be retained.
    d. KF stated that during construction, CDFW and SWB will want to make sure that foreign materials are not being introduced into the creek, since it is a steelhead salmon-supporting creek. Although the steelhead do not live in the creek, since conditions are too warm and urban, they can travel though the creek to the headwaters. Therefore CDFW and SWB will want to make sure materials from how the structure is cast or constructed does not impact the creek. Mitigation for some habitat loss due to conversion from riparian corridor to urban infrastructure would likely be necessary, and there may be opportunities for mitigation where the creek extends above or outside SCWA's easements. KF believes the project would at least require a Waste Discharge Requirement and a Streambed Alteration Agreement.
    e. SG added that the project may also need to capture runoff from the traveled way of the bike/ped path.
        i. KF believed that capturning the runoff from the pathway could be delivered to biofiltration areas adjacent to the creek.

f. KF stated that although SCWA has sediment basins upstream, where much of the aggregate material is captured, fines continue downstream and accumulate over time, particularly where there is woody debris or cattails in the creek. Therefore, the SCWA Stream Maintenance Program tries to remove debris or plant vegetation that discourages cattails. KF stated that one of the best ways to discourage cattail growth is shade, which will be lost with the removal of trees.
g. Overall, from an environmental permitting perspective, KF believes the project is feasible, since although some riparian corridor is being lost for urban infrastructure, there is already a lot of urban infrastructure associated with the creek. Should there be a need for more environmental mitigation than what can be accommodated on-site, the City might have land and opportunities for mitigation.

3. Jon Niehaus (JN), of SCWA's Stream Maintenance Program, stated that sediment removal immediately downstream of US 101 is typically done every 8-10 years, and that a ramp structure between the maintenance road and channel would make sediment removal more challenging, since an excavator would not be able to travel along the bank. Instead a bulldozer or skid steer would be needed to transfer the material down the channel to a loadout spot. JN stated that a curved ramp structure over the creek could also make maintenance more difficult if an excavator cannot fit under the structure.
    a. KF and JN agreed that the large trees could impede movement of maintenance equipment around the structures, so additional tree removal might be needed.
4. JN stated that if the City will require an easement for the project, it might make sense for the City to assume maintenance responsibilities for the creek around the structure.
5. Regarding vertical and horizontal clearances, JN stated that clearance would be needed for through traffic of SCWA's 10-wheeler dump trucks and large excavators. Ideally, the vertical clearance should also accomodate the dump truck with a raised bed, which would be needed for repaving asphalt roads.
    a. SG discussed that due to the geometric constraints of the site, vertical clearance can be provided for standard pickup trucks, but a closer look would be necessary to see if dump trucks can also be accommodated.
6. SG reviewed the culvert extension proposed at Redwood Drive to provide more safety.
    a. JN did not foresee issues with the extension and KF added that an ACE permit world be required.
7. SGA and SCWA reviewed the questions:
    a. Slide 6 - Does Sonoma Water maintain Copeland Creek in the area between US 101 and Commerce Boulevard?
        i. SCWA does not maintain the area between US 101 and Commerce Boulevard, which is in the State right of way.
    b. Slide 7 - What vertical clearance is required above Sonoma Water's maintenance roads for trucks and equipment?

        i. Clearance to accommodate 10-wheeler dump trucks and large excavators, with ideal vertical clearance for a dump truck with a raised bed.
    c. Slide 7 - What horizontal clearance between obstructions is required along Sonoma Water's maintenance roads for trucks and equipment?
        i. Clearance to accommodate 10-wheeler dump trucks and large excavators, ideally with vertical clearance for a dump truck with a raised bed.
    d. Slide 8 - Does Sonoma Water require continuous access to the creek from the top of bank?
        i. KF stated that SCWA needs access to the creek from the top of bank only in certain locations and at certain distances. For example, a bulldozer might need to get down to the creek at Redwood Drive to work westward.
        ii. JN stated that both design alternatives (i.e., with the retaining wall adjacent to the maintenance road, and with the spiral approach over the creek), make creek maintenance more difficult, but both look feasible. A bulldozer within the creek channel would need to push material to a loadout spot for an excavator to remove.
        iii. Gordon Sweet (GS), of BKF Engineers, asked if sediment removal is performed along the entire length of the creek corridor or focused on certain locations, such as where the culvert ends or where sedimentation requires it.
            1. JN stated that some discrete locations are dug out regularly, but all areas need removal at some point, since Copeland is aggredational. For example, upstream areas by Snyder Lane need sediment removal annually, but the location at Redwood Drive might need removal every 10 years. JN confirmed that the type of bulldozers used in the creek are smaller skid steer types. Regular general maintenance activities include weeding, fire fuel reduction, fence repair, and removal of debris and trash.
    e. Slide 21 - Do the vertical and horizontal clearances needed for Sonoma Water's maintenance roads apply to both the north and south sides of the creek?
        i. Yes, the vertical and horizontal clearances apply to both slides of the creek.
    f. Slide 26 - We understand Sonoma Water has ownership, in fee, of the Copeland Creek channel on the west side of US 101, but Caltrans' 2013 right-of-way map does not reflect this. Would you please confirm the ownership and limits?
        i. GS confirmed the following:
            1. Parcels west of Redwood Drive – Both north (APN # 143-391-030) and south (APN # 144-010-077) parcels owned by SCWA

a. Includes easement from SCWA to City for an 18-foot wide bike path
2. Parcels east of Commerce Boulevard – Owned (in fee) by Rohnert Park (APN # 143-380-014)
   a. Comcast also appears to own property (possessory interest) on the east side but exact location is unclear (APN # 860-000-121)
   b. Includes easement from City of Rohnert Park to SCWA for flood control activities

g. Slide 31 - Does Sonoma Water need to access the Copeland Creek maintenance road from southbound Commerce Boulevard?
   i. JN stated that it would be ideal if the proposed pedestrian refuge island was traversable, so that chipper and dump trucks could make wide right turns from the northbound direction and if necessary, access the road from the southbound direction as well.
      1. SG stated that SGA will follow up with the traffic engineer to determine if the proposed pedestrian refuge island is required, and/or can be redesigned.
         a. *According to W-Trans, the raised island north of the crosswalk, which provides the greatest safety benefit, should be retained. It is preferable to keep the south island, and make it mountable, but if constructability on the bridge is infeasible, colored/stamped pavement treatment should be used at a minimum.*

8. Action Items
   a. SGA
      i. Reexamine bridge geometrics to determine if clearance can be provided for 10-wheeler dump trucks along SCWA's maintenance roads.
      ii. Inquire with Caltrans about maintenance responsibilities and activities for the creek area between US 101 and Commerce Boulevard.
      iii. (Completed) Follow up with traffic engineer regarding pedestrian island.
9. Attendees
   a. Sonoma Water
      i. Kevin Booker, Principal Engineer, kevin.booker@scwa.ca.gov
      ii. Jon Niehaus, Stream Maintenance Program, jon.niehaus@scwa.ca.gov
      iii. Keenan Foster, Principal Environmental Specialist, keenan.foster@scwa.ca.gov
   b. BKF Engineers
      i. Gordon Sweet, gsweet@bkf.com
   c. Steven Grover & Associates
      i. Steven Grover, sgn@stevengrover.com
      ii. Jimmy Darling, jimmy@stevengrover.com

ROHNERT PARK
HIGHWAY 101 BIKE AND PEDESTRIAN CROSSINGS
FEASIBILITY STUDY

Sonoma Water Coordination Meeting - Notes
Monday, November 16, 2020, 1:00 PM
Online Meeting - Zoom

1. The purpose of the meeting was to inform Sonoma Water (SCWA) about the project and gather information that would assist the City of Rohnert Park assess the feasibility of improvements to existing crossings of US 101 or new bike/ped crossings along Hinebaugh Creek or Copeland Creek.
2. Steven Grover (SG), of SGA, opened the meeting with a presentation that included an overview of the project's purpose and need and the results of a preliminary assessment of seven locations along the Highway 101 corridor. SG shared that the two creek locations are the most promising locations for a new bike/ped crossing of US 101. The presentation concluded with questions on four topics for which the consultant team requested discussion with and input from SCWA:
   a. Creek maintenance and requirements
   b. Flooding
   c. Future plans
   d. Environmental considerations
3. Creek Maintenance and Requirements
   a. According to Jon Niehaus (JN) of SCWA, the City owns the Hinebaugh Creek and Copeland Creek properties on the east side of US 101, and SCWA owns the creek properties on the west side. While SCWA has an easement with the City to maintain the creeks in City right-of-way on the east side, the City has an easement with SCWA to maintain the paved trails along in SCWA right-of-way on the west side. JN added that SCWA activities include creek maintenance for flood control, fire fuel reduction, public safety, etc., and that access for maintenance vehicles, chipper trucks, and equipment to haul out silt is required.
   b. JN confirmed that SCWA does dredge the channels, in addition to cutting vegetation, and that frequency of sediment removal depends on the location. Near Snyder Lane, sediment removal is annual, but sediment removal further downstream occurs less often. JN recalled that at Hinebaugh Creek, sediment removal downstream of US 101 was performed a few years ago.
   c. Kevin Booker (KB), of SCWA, stated that SCWA was in the process of working with the City to take over the City's easements for the pathways within its own right-of-way.

d. JN stated that maintenance of the culverts under US 101 is the responsibility of Caltrans.

4. Flooding
   a. JN was aware that flooding around Redwood Drive has occurred but does not believe it is due to the hydraulic capacity of the channel or to a build-up of debris on the upstream side of the culvert. JN believed the culverts under US 101 are under-capacity and restrict water flow, resulting in flooding.
   b. In response to potentially using the culverts under US 101 as a bike/ped undercrossing, JN stated that the main concern would be the flooding, and that incurring greater risk of water restriction and flooding would be a decision to be made by the City. Kevin Booker (KB), of SCWA, agreed with JN and acknowledged that since the culvert is not SCWA property, SCWA could not say whether modifications would be acceptable.
   c. JN suggested examining the hydraulic capacity or water restriction of the culverts and determining whether the project would reduce the hydraulic capacity of the culverts. JN added that SCWA does not do any maintenance in the culverts. JN stated SCWA would be fine with the project in general, as it does not restrict SCWA's access for maintenance.
   d. KB stated that although SCWA funds gauges along the creeks, it does not conduct any warnings for flooding. JN confirmed this and added that SCWA would not take on responsibility for removing rails if they were added for bike/ped travel.
      i. SG replied that the City may be responsible for removing rails or structures added to facilitate bike/ped travel through the culverts.
      ii. Eydie Tacata (ET), of Rohnert Park, believed Copeland Creek is susceptible to flash flooding and stated that the gauge in the project area is located too close to US 101 for a flood warning to be effective. ET added that a process may have to be developed to use readings from gauges further east or upstream to determine whether an undercrossing would be closed.
      iii. Vanessa Garrett (VG), of Rohnert Park, added that cleaning up after flood events would be consistent with other agreements with SCWA in terms of installing paths if the City takes over maintenance.
   e. Gordon Sweet (GS), of BKF Engineers, asked if SCTA would provide any hydraulic modeling or analysis of the creeks, similar to what was done for the Lynch and Washington project to better understand the effects upstream and downstream of an undercrossing project. KB replied that the City and Consultants could provide SCWA with an information request (see Item 7, "Requests for Information"), and added that Phil Wadsworth of SCWA would know if there are hydraulic studies of the channels.

5. Sonoma Water and Rohnert Park's Future Plans for the Creeks
   a. JN stated that SCWA has no future plans for the creeks, aside from continued regular maintenance.
   b. VG stated that the City's plans for the creeks is to upgrade the existing asphalt paths to concrete.
   c. Jeff Beiswenger, of Rohnert Park, added that in the future, the unpaved paths may be paved if they provide for gap closure of the City's active transportation network.
6. Environmental Considerations
   a. Regarding impacts to trees in SCWA property, JN did not believe there are any heritage trees within SCWA property, but acknowledged that the project would have to account for CEQA, permitting, and mitigation, as well as any easements and right-of-way conditions.
   b. JN believed one key environmental consideration for a project along Copeland Creek would be steelhead trout, and stated that any modifications to the culvert could not affect migration.
   c. JN is not aware of any pollution in the creeks and added that SCWA has not encountered any signs of pollution in its testing as part of sediment removal.
   d. Gordon Sweet (GS), of BKF Engineers, stated that the creeks include mitigation sites for tree replacement and riparian areas as part of other projects and asked if SCWA has a record of mitigation sites, since any permanent impacts to mitigation sites as a result of the project would need to replaced.
      i. JN replied that SCWA has a database of mitigation planting sites, and stated that most of the channels will be mitigation areas, depending on how the areas have been managed. KB added that Keenan Foster of SCWA would also know.
7. Requests for Information
   a. City
      i. Information (plat and legals) about SCWA and City easements or right-of-ways
      ii. Documents about City's work to upgrade the creek trails
      iii. Maintenance requirements for creek paths, if available
   b. Sonoma Water
      i. Hydraulic Modeling for Hinebaugh Creek and Copeland Creek (inclusive of design and base flood information
      ii. SCWA Right-of-Way Mapping
      iii. SCWA Environmental Mitigation Sites
         1. Maps that show current/existing mitigation sites and/or future (proposed) mitigation sites along Hinebaugh Creek and Copeland Creek, in the vicinity of US 101
      iv. SCWA Maintenance Requirements, Access Points, Agreements (SCWA-City and SCWA-Caltrans), and Frequency/Schedule

v. Utility Information
   1. Is SCWA aware of any utilities located along the creek berm/banks?
vi. SCWA As-Builts Plans
   1. Based on information from Marin-Sonoma Narrows C2, both Hinebaugh Creek and Copeland Creek appear to be "engineered" conveyances, instead of natural or modified waterways; therefore, as-builts would show historical information on the engineered/completed creek channels.
vii. SCWA As-Builts Reports
   1. In support of engineered as-builts above, SCWA may have supporting documentation/hydraulics reporting for Hinebaugh and Copeland Creeks.
viii. Caltrans Hydraulic Reports
   1. Since SCTA (and their consultant) and Caltrans may have included SCWA in the design development process for their 101/Central "A" (EA 04-0A18U1) and 101/Wilfred (EA 04-129651) projects, would SCWA please check if it has copies of the Drainage/Hydraulic Reports from these projects?

8. Attendees
   a. Sonoma Water
      i. Jon Niehaus, Stream Maintenance Program, jon.niehaus@scwa.ca.gov
      ii. Kevin Booker, Principal Engineer, kevin.booker@scwa.ca.gov
      iii. Blake Atkerson, Right-of-Way, blake.atkerson@scwa.ca.gov
      iv. John Monaghan, john.monaghan@scwa.ca.gov
   b. Rohnert Park
      i. Vanessa Garrett, VMarin@rpcity.org
      ii. Jason Sampietro, jsampietro@rpcity.org
      iii. Eydie Tacata, etacata@rpcity.org
      iv. Jeff Beiswenger, JBeiswenger@rpcity.org
   c. BKF Engineers
      i. Gordon Sweet, GSweet@bkf.com
   d. Steven Grover & Associates
      i. Steven Grover, sgn@stevengrover.com
      ii. Oscar Tsai, oscar@stevengrover.com
      iii. Jimmy Darling, jimmy@stevengrover.com

9. Additional Information
   a. Link to location of USGS gauge on Copeland Creek: 38°20'36.0"N 122°42'03.0"W (use drop-down menu to access a summary of available data for the gauge/site)

ROHNERT PARK
HIGHWAY 101 BIKE AND PEDESTRIAN CROSSINGS
FEASIBILITY STUDY

Public Meeting with the Bicycle and Pedestrian Advisory Committee - Notes
Monday, December 14, 2020, 5:30-7:00 PM
Online Meeting - Zoom and simulcasted on public access television channel 26

1. The purpose of the meeting was to update members of the public and the Rohnert Park Bicycle and Pedestrian Advisory Committee (BPAC) about the project, solicit feedback about the potential crossing locations assessed, and solicit input on potential crossing alignment alternatives.
2. Steven Grover (SG), of SGA, opened the meeting with a presentation that included an overview of the project's purpose and need, the results of a preliminary assessment of seven locations along the Highway 101 corridor. The presentation concluded with three questions for which the consultant team requested discussion with and input from the BPAC and public:
   a. Do you agree with the assessment of the seven crossing locations and recommendations?
   b. Do you prefer an undercrossing or overcrossing, with the understanding that an undercrossing would likely be less expensive and require shorter approaches, while an overcrossing would be more open, visible, and feel more inviting?
   c. What are your safety concerns for crossing Commerce Boulevard?
3. Crossing Location Assessments and Recommendations
   a. Tim Hensel (TH) and Gary Gutierrez (GG), of the BPAC, agreed with the assessment of locations.
   b. GG added that a crossing at Copeland Creek would connect to the path on the east side to go all the way to [inaudible] Canyon, tying into a larger plan, and giving it merit.
   c. Kimberley Finale (KF), of the BPAC, liked that the assessment recommended incremental improvements at Golf Course Drive and Rohnert Park Expressway (RPX). KF acknowledged that there are far less opportunities for east-west travel on the south side of the city and believed that a crossing at Copeland Creek (location 6) would be vital for people in the A and B neighborhoods to get to the other side of town without going into Cotati or causing further congestion at RPX. KF stated that she walks and bikes the routes almost daily and understands the challenge of crossing US 101 in Cotati or via RPX. KF was disappointed that the assessment recommended excluding location 7 (Cotati/Neighborhood A) from further study, believing that a crossing near Southwest Boulevard and Commerce Boulevard would be ideal. However KF acknowledges that the city boundaries of Rohnert Park and Cotati are blended in this area.

d. Creighton Bell (CB), of the BPAC, agreed with the assessments and the two locations (Hinebaugh Creek and Copeland Creek) recommended for further study.
e. Shirley Johnson (SJ), of the BPAC, also agreed with the assessment and recommendations and stated that a crossing at Copeland Creek would connect well for people wanting to go watch a movie or go to Target.

4. Preference for an Undercrossing or an Overcrossing
   a. TH preferred an overcrossing, despite it being more expensive than an undercrossing, because flooding means the crossing will experience closures and require regular maintenance activities and costs. TH expressed safety concerns of an undercrossing, which included the low vertical clearance of the Copeland Creek culvert, limited width to go around people, and confined experience of the long 300-foot underground passage. TH did not mind, and liked, approaches with switchbacks or loops and believed that straight approaches that require backtracking or traveling an additional 600 feet are more daunting.
   b. CB preferred an overcrossing both for maintenance and safety of the general public and believed looped approaches would be better than straight lines.
   c. GG acknowledged that the more cost-effective the project, the more likely it will be completed in timely manner. GG stated that an undercrossing would be fine, but shared TH's concerns with safety and lighting. GG was fine with switchbacks and believed switchbacks might provide an opportunity to connect to places the crossing wouldn't otherwise connect.
   d. SJ stated that an undercrossing is preferred, because being in a wheelchair, it gives people a chance to get out of the rain, whereas it would be a mess to travel along long paths in the rain. SJ shared GG's comments that an undercrossing could cost less and be completed sooner, and added that it would be less intrusive to build. SJ expressed concerns about the environmental impacts that the columns for an overcrossing could have on the creek. SJ also shared other speakers' concerns for lack of lighting in the undercrossing and added the belief that solar lighting could be added.
      i. TH asked if the design of an overcrossing could incorporate shelter or partial shelter from rain.
         1. SG stated that there are precedents for enclosed or sheltered overcrossings that provide cover from rain or sun.
         2. KF added that lighting could also be incorporated to the shelter.
      ii. As a frequent walker who walks at 4 AM with a headlamp, KF preferred an overcrossing, and KF would not use an undercrossing, but would use an overcrossing without hesitation. KF stated that in consideration for people in wheelchairs and seniors, ease of use and accessibility of an overcrossing would be extremely important. KF acknowledged that the columns of an overcrossing could have environmental impacts on the

creek, but added that for someone who might rely on a crossing, closing an undercrossing due to flooding for extended periods of time would be a major inconvenience and potential safety hazard if they try to use the undercrossing anyway.

5. Safety and Crossing Commerce Boulevard

Reference image: potential touchdown locations for an overcrossing at Copeland Creek

   a. KF stated that an overcrossing that connected to the north-south path along Commerce Boulevard would be great for the residents of the new housing development under construction at Avram Avenue. KF believed the wide space and path along Commerce Boulevard provides plenty of space for passing and would be a good opportunity to tie into an overcrossing. KF stated that if an overcrossing landed at Avram Avenue (Touchdown B), it would be very visible and provide easiest access. People wishing to access the Copeland Creek Trail could head east on Avram Avenue and use several pathways between the apartment buildings. KF added that the city should consider adding an RRFB to the existing crosswalk at Avram Avenue, since speeding occurs in the area. KF asked city staff for information about the parking for the new apartment building, the width of new sidewalks, and whether bike lanes are planned on Avram Avenue.
      i. Eydie Tacata (ET), city staff liaison to the BPAC, stated that the new apartments (Bella Creek) will have to provide parking, but acknowledged that overflow parking would use the street. ET believed that the new sidewalk will have standard widths, but will confirm, and stated that there may not be enough room on Avram Avenue to accommodate bike lanes without removing street parking. ET asked Vanessa Garrett (VG),

Deputy City Engineer, whether the sidewalk on Avram Avenue would be widened.

1. VG confirmed that the new sidewalks on Avram Avenue will be standard 5-foot-wide sidewalks and added that the existing asphalt creek trail behind Bella Creek will be replaced with concrete.

ii. CB recalled that the south side of Avram Avenue is usually filled with parked cars, and may be intimidating for cyclists to pass through, so landing at Copeland Creek on the west side of Commerce Boulevard (Touchdown A) might be better.

b. TH agreed with KF that landing at Touchdown B would be convenient and that people could also access the creek trail from Avram Avenue via the pathways between the apartments. TH was not concerned with using the crosswalk at Avram Avenue to cross Commerce Boulevard, and believed that if an overcrossing landed at Touchdown A, signage would be needed to direct people to the existing crosswalk. TH stated that if people had to backtrack north along Commerce Boulevard from Avram Avenue to the creek trails, the distance is not too far and would be easy to do.

c. Leo Tacata (LT), a city staff member attending the meeting as a resident of B Section and frequent user of the Copeland Creek Trails, stated that Avram Avenue currently might not experience very much bike/ped use, since people will remain on, or get to, the Copeland Creek Trails because the trails look and feel safer and more friendly. LT stated that cyclists using the north side trail frequently enter Commerce Boulevard abruptly at the creek, despite the crosswalk being nearby at Avram Avenue. LT preferred that an overcrossing connect directly to the creek trails, and believed that if it did not, bollards would be necessary to prevent cyclists from entering the roadway unsafely.

i. TH added that it might be possible to add a new crosswalk at Copeland Creek, but since the roadway is busy, flashing lights or some other features would need to distinguish the new crossing from the existing crosswalk at Avram Avenue. TH has successfully used the crosswalk with pedestrian-activated lights on Snyder Lane, but pedestrians still have to keep their eyes open.

ii. SG stated that the consultant team's traffic engineer can examine a new crosswalk on Commerce Boulevard at Copeland Creek.

iii. ET stated that if there is an existing safety issue with cyclists entering the roadway, a new crosswalk on Commerce Boulevard should be studied, regardless of the new US 101 crossing.

6. SG asked the BPAC and public for confirmation that Touchdown locations 2, D, and E could be ruled out. SG acknowledged that an overcrossing would ideally land at both B and C, but stated that it may not be warranted.

a. In general, the BPAC agreed with eliminating Touchdowns 2, D, and E.

b. TH agreed and added that landing on Copeland Creek's northside trail (Touchdown C) would require a lot of structure and a spiral approach spanning the width of the creek might negatively stand out and compete visually with the creek environment and redwood trees.

i. SJ added that the project should not mess with the trees.

ii. KF added that an overcrossing landing at Touchdown C would be long, requiring more material, and potentially less cost effective.

iii. SG stated that the consultant team will do a more careful survey of existing trees at the touchdown locations and has heard the BPAC's concerns about column locations and environmental impacts.

7. SG asked the BPAC and public for feedback on whether the crossing location at Hinebaugh Creek or Copeland Creek was preferred.

a. CB stated that Copeland Creek was preferred because at Hinebaugh Creek, the SMART tracks and golf course are a barrier to further east-west travel, while Copeland Creek is an existing east-west route that has a crossing of the SMART tracks and goes all the way to Sonoma State and the regional park.

b. Since it is very difficult to prevent access to the culvert, SG asked what happens to the culvert if an overcrossing is constructed and is it okay of people continue to use it as they are currently doing so?

c. KF stated that Copeland Creek is preferred hands-down because a crossing at Hinebaugh Creek would require people to go back to an already congested area of the city. Given the new apartments being constructed, KF believes an overcrossing at Copeland Creek would alleviate congestion north of RPX by providing residents on the south side with an easier way to cross US 101. KF added that an overcrossing at Copeland Creek would allow residents, especially in the A and B Sections, to walk or bike to work if they work close to home on the opposite side of the freeway, but currently have to drive, providing economic opportunities. KF recalled needing to drop off a car at McLea's [Tire and Automotive Shop] and walking back to B Section, which was maybe three miles in each direction.

d. TH also preferred Copeland Creek, which connects to the shopping center on the west side and appears to be less stressful and intimidating to travel on or to, as compared to Hinebaugh Creek. TH added that in the future, the BPAC should reexamine the north-south Redwood Drive corridor on the west side and see if improvements could be made to bike lanes and pedestrian facilities.

e. SJ agreed that Copeland Creek benefits the community more, but added that a crossing a Hinebaugh Creek would allow residents of a few new hotels in the area to use the city's bike program, travel between the east and west sides, and access the city center without having to drive and reducing VMTs.

f. CB stated that if the City constructs a vehicular crossing of US 101 at State Farm Drive, there would be two crossings near each other with a crossing at

Hinebaugh Creek, and Copeland Creek provides a more diverse location for a crossing.

8. Oscar Tsai (OT), of SGA, stated that the next steps for the consultant team are to develop the Preliminary Feasibility Report for review by city staff, followed by a Draft Feasibility Report in February, at which time the consultant team will present updates to city committees. A second public meeting is anticipated to be conducted around March, and the Final Feasibility Report would be completed at the end of April.
9. Written comments from the meeting's chat board:
    a. GG - Agreed. There are several options to get to Copeland creek.
    b. ET - Yes. Quite a few back-ons.
    c. GG - Prefer Copland Creek option, especially with consideration for connecting to SSU and Crane Canyon.
    d. LT - I agree with the Copeland Creek preference. The Copeland Creek path is Rohnert Park's "expressway" path that's the easiest and most straightforward crossing through Rohnert Park.
    e. GG - It seems that the Copeland Creek route will serve more of the community. I believe with traffic considerations that connecting directly to the path rather than connecting at Avram would be more effective. I believe C may be a good option.
    f. ET - I think that a ramp that circles or backswitches might be a good way to slow cyclists down.
    g. LT - Thanks! This is exciting - it will be a needed and excellent addition to our community
10. Attendees
    1. Shirley Johnson
    2. Creighton Bell
    3. Tim Hensel
    4. Gary Gutierrez
    5. Kimberly Finale
    6. Eydie Tacata
    7. Vanessa Garrett
    8. Jeffrey Beiswenger
    9. Leo Tacata
    10. Mike Son
    11. Gary Antonucci
    12. Garrett Dekker
    13. Molly McNally
    14. Steven Grover
    15. Oscar Tsai
    16. Jimmy Darling

Joint Special Meeting of the
Bicycle and Pedestrian Advisory Committee and Planning Commission and Planning Commission Regular Meeting

Thursday, March 25, 2021
6:00 P.M.

1. CALL TO ORDER
Chairperson Orloff called the regular meeting to order at 6:00 p.m.

2. PLEDGE OF ALLEGIANCE
Led by Chairperson Orloff.

3. ROLL CALL
Bicycle and Pedestrian Advisory Committee
Present: Creighton Bell, Committee Member
Kimberly A. Finale, Committee Member
Gary Gutierrez, Committee Member
Tim Hensel, Chairperson

Absent: Ann Marie Rodriguez, Committee Member

Planning Commission
Present: Tramaine Austin-Dillon, Commissioner
Fanny Lam, Vice Chairperson
Marc Orloff, Chairperson
Charles Striplen, Commissioner

Absent: Daniel A. Blanquie, Commissioner

Staff attending via Zoom Video Communications: Planning Manager, Jeff Beiswenger, Recording Secretary of BPAC, Eydie Tacata, Recording Secretary of PC, Jennifer Sedna, and Consultants Steven Grover and Ian Barnes.

Staff present: IS Analyst, Mike Son.

4. PUBLIC COMMENT
Leo Tacata, Staffperson, stated that City of Rohnert Park Foundation is currently accepting applications for its annual Small Grants Program, and the deadline to apply is April 23, 2021.

6. AGENDA ITEMS

6.1 **STUDY SESSION** – City of Rohnert Park – Highway 101 Bike/Pedestrian Crossing Feasibility Study

Planning Manager, Jeff Beiswenger, introduced the item and answered questions and comments from the Commission and Advisory Committee, including: timing of the project in reference to the Southwest roundabout; the location of the overcrossing; issues with the underpassing including confinement, flood and debris and the creeks; LEED alternatives to add impervious surfaces, setbacks, etc. in regards to the creeks; safety concerns including adequate lighting; width of the path in regards to social distancing, size of and number of people in a group; flat areas for people to rest; touchdown locations; retaining existing trees; partnering with SSU for branding of the City; inclusion of bicycles and electric powered devices (e.g. scooters and bicycles); and, inclusion of cultural and aesthetic motifs.

Consultant Steven Grover joined the meeting to present the item and answered questions from the Commission and Advisory Committee, including: differences in maintenance between the plans; ADA accessibility; and, the design of crosswalk signal for safety.

Public Comment: None.

6.2 **GENERAL PLAN UPDATE STUDY SESSION** – City of Rohnert Park – Circulation Element

Planning Manager, Jeff Beiswenger, presented the item and answered questions and comments from the Commission and Advisory Committee, including: encouraging staff to implement LEED, to incentivize and have the plan reflect the diverse populations of the City; code enforcement of parking, specifically combining parking and bike lanes on Golf Course Drive to continue past RPX; increase charging stations in parking lots; wider sidewalks; extending bicycle connections to SOMO Village and downtown; improving parking regulations for recreational vehicles on the streets; time to walk within the City; partnering with Sonoma State regarding automobile impact on the street; traffic generated from the Casino; damage from heavy trucks on the roadways; and, moving bicycles away from the pedestrians for safety.

Consultant Ian Barnes joined the meeting to present the item.

Public Comment: None.

7. **ADJOURNMENT OF JOINT SPECIAL MEETING WITH THE BICYCLE AND PEDESTRIAN ADVISORY COMMITTEE**

Chairperson Orloff adjourned the special joint PC BPAC meeting at 8:16 p.m. Committee Member Gutierrez made the motion to adjourn and Committee Member Finale seconded to adjourn the BPAC Meeting.

8. **CONSENT CALENDAR - ADOPTION OF MINUTES**

8.1 Approval of the Draft Minutes of the Planning Commission Meeting of March 11, 2021

ACTION: Moved/seconded (Austin-Dillon/Lam) to adopt Minutes of the Planning Commission Meeting of March 11, 2021.

ACTION: Moved/seconded (Austin-Dillon/Lam) to adopt Minutes of the Planning Commission Meeting of March 11, 2021.

Motion carried by the following unanimous (4-0-1) roll call vote: AYES: Austin-Dillon, Striplen, Lam and Orloff; NOES: None; ABSTAIN: None; ABSENT: Blanquie.

9. **AGENDA ITEMS**

9.1 **PUBLIC HEARING DEVELOPMENT AREA PLAN AND TENTATIVE MAP** – File Nos. PLSD20-0003 and PLDP20-0003 – Brookfield Homes – University District LLC Tentative Map and Development Area Plan I

ACTION: Moved/seconded (Austin-Dillon/Striplen) to continue the Public Hearing for the UD LLC Development Area Plan and Tentative Map to a date certain of April 22, 2021.

Motion carried by the following unanimous (4-0-1) roll call vote: AYES: Austin-Dillon, Striplen, Lam and Orloff; NOES: None; ABSTAIN: None; ABSENT: Blanquie.

10. **ITEMS FROM THE PLANNING COMMISSION**

Commissioner Striplen noted an article published in Science Magazine regarding acute toxic affects to Coho Salmon from vehicle tires. Vice Chair Lam inquired about incidences of passengers getting hit from crossing the street and how to address this issue. Chair Orloff made a second and Commissioner Striplen made a third on requesting this report. Chair Orloff noted the seminar on housing policies in Sonoma County.

9. **ITEMS FROM THE DEVELOPMENT SERVICE STAFF**

Staffperson Beiswenger noted the Commission will have a meeting for both the second and fourth Thursdays in April.

10. **ADJOURNMENT**

Chairperson Orloff adjourned the regular meeting at 8:25 p.m.

Marc Orloff, Chairperson

Jennifer Sedna, Secretary

ROHNERT PARK
HIGHWAY 101 BIKE AND PEDESTRIAN CROSSINGS
FEASIBILITY STUDY

Public Meeting with the Planning Commission and the Bicycle and Pedestrian Advisory Committee - Notes
Thursday, March 25, 2021, 6:00-7:00 PM
Online Meeting - Zoom and simulcasted on public access television channel 26

A recording of this meeting is available via the City's "Meeting Central" webpage: https://rpcity.granicus.com/player/clip/1410 (timestamp 00:07:40 to 01:12:00)

1. The purpose of the meeting was to update the Rohnert Park Planning Commission (PC), the Rohnert Park Bicycle and Pedestrian Advisory Committee (BPAC), and members of the public, about the project, solicit concurrence with the findings of the crossing locations assessment, and alignment alternative recommendations, as well as solicit feedback about the conceptual design alternatives.
2. Steven Grover (SG), of SGA, delivered a presentation that included an overview of the project's need and purpose, public input received, the Feasibility Study's process, findings, and preliminary recommendations, and the project's conceptual design alternatives.
3. The presentation concluded with several topics for which the consultant team requested discussion with and input from the Planning Commission and BPAC, including:
    a. Priority compared to other transportation/capital improvement projects
    b. Location for new bike/ped overcrossing
    c. Location of touchdowns
4. Priority compared to other transportation/capital improvement projects
    a. In response to a request for information from BPAC Chair Tim Hensel (TH), Eydie Tacata (ET), Management Analyst and BPAC Staff Liaison, stated that the bike/ped crossing over US 101 has been a high-priority project in the City's Bike/Ped Master Plan since at least 2008 and has remained high-priority in subsequent updates to the plan. The BPAC has discussed the crossing in the past and has consistently ranked it very high among bike/ped projects, since it provides connections not just locally but among regional systems.
    b. Kimberly Finale (KF), of the BPAC, asked if the project would be timed with the roundabout project at Commerce Boulevard and Southwest Boulevard, which is not too far from the proposed crossing.
        i. ET clarified that this project is a Feasibility Study for a bike/ped crossing with a horizon of 15-20 years, whereas the roundabout, which is almost fully designed, could be implemented in a few years.

        ii. SG added that to quickly realize an overcrossing project such as this one, the City would need to take an aggressive approach to move through the required phases, and that at this time, there may be greater opportunities for funding for these types of bike/ped projects.
5. Location for new bike/ped overcrossing
    a. TH concurred that the Copeland Creek location was best for a crossing and would provide the shortest route over the freeway. The Expressway is already very busy, and a crossing at Copeland would provide access to many apartments and shopping centers. TH stated that he walked the area a few days ago, and that Copeland Creek is not far from where lots of ppl walk on the Expressway. TH believes that traveling south from RPX to use the bridge would be safer and not that far.
    b. TH concurred that an undercrossing would be very confined and close-quartered, and would not feel comfortable using a tunnel that runs under several lanes of traffic, especially at night. TH concurred with the flood issues discussed in the presentation and added that a tunnel would also have to be closed until crews could remove accumulated debris.
    c. Chuck Striplen (CS), of the PC, likes the Copeland Creek location, and believes it is the right place to connect these parts of the City. CS fully-supports the elimination of the undercrossing alternative so as not to overburden the expectations of the already-beleaguered creeks. CS appreciated the consultant team's coordination with Sonoma Water's Stream Maintenance Program. CS added that since the overcrossing would be so close to the creek, the project should explore the latest low-impact development measures, so as not to add more impervious surfaces that would worsen the creeks and water quality.
        i. SG stated that locations have been identified for biofiltration.
6. Location of touchdowns
    a. TH stated that the BPAC concurs with the recommended touchdown locations, which the committee has discussed in the past, since they offer the shortest route to destinations and other bike/ped connections, with the least imposition into the creek.
    b. KF stated that she is a big fan of Alternative A's east touchdown plaza at Copeland Creek. KF found the plaza very appealing and believes it would modernize a section of the City that could use more attention, especially with an adjacent high-density apartment complex currently being constructed. KF believes that the trees should be saved at all costs, since they provide a visual barrier from freeway and shade for the plaza. KF stated that she uses this section of roadway regularly and can easily visualize families walking across the street to sit in the plaza in the shade, on 100-degree days at six o'clock, when it is time for kids to run around before or after dinner. KF sees the plaza as a gathering spot, especially on hot summer afternoons, and believes waterbottle refill stations would be a good addition.

c. Fanny Lam (FL), of the PC, likes the plaza and agreed with KF that it would be a place of gathering. FL stated that she has kids and would love to have more places to hang out. FL added that it would be great to involve more non-profits in the City to add artwork for kids to experience and engage with.
d. Marc Orloff (MO), Chair of the PC, stated that the meandering approach of Alternative B would also be appropriate if it could be integrated with more family-oriented spaces in line with the plan to renovate the west end area of Southwest Boulevard, not to far from the project.

7. Additional comments on conceptual design
   a. TH thinks that a 12-foot width would be appropriate for the overcrossing and liked the landscaping with trees. TH stated that saving the redwoods was a plus and would like mitigation in the form of tree replacement, should trees be removed.
   b. TH stated that the aesthetics of the crossing could be a boast or a negative. TH likes the butterfly arch concept, and stated that it would be glamorous and noticeable at the entrance to Rohnert Park on US 101. TH reminded everyone that the structure should be aesthetically beautiful, but also humble, since TH did not want the bridge to overshadow the beauty of environment. TH wondered if symbols of the City and region (e.g., wine country) could be incorporated into the aesthetics of the crossing.
   c. Gary Gutierrez (GG), of the BPAC, stated that the presentation and work captured and addressed the concerns of BPAC that were expressed at the last meeting. GG asked whether the bridge would meet accessibility requirements.
      i. SG stated that ADA accessibility requirements would be met by any design, and that the approach for Alternative A, landing at Copeland Creek, can achieve 5% slope, which is comfortable for all types of users and does not require additional measures applicable to a ramp, should the slope exceed 5%. However, the approach for Alternative B, landing at Avram Avenue, would exceed 5% slope and need to be designed as a ramp, with handrails and flat landings for every 30 inches of rise.
   d. KF stated that the overcrossing has a lot of potential and believes that the butterfly arch is beautiful. KF sees the project as a landmark, and does not feel it would be over-the-top, since it would modernize this part of town and serve as a wonderful start and beautiful beginning for ways to address other maturing neighborhoods. According to KF, 12-foot width for the traveled way wouldn't be bad, but 14 feet would be better, because families and groups tend to spread out when they travel and don't always step out of the way or pay attention. Therefore, the more surface area, the better. KF believes that the crossing would attract a high amount of use, more than can be discussed at the moment, and that greater width would allow for City growth, and would open up a whole new world for bike/ped travel.

      i. TH agreed with KF and appreciated the perspective on width and how groups tend to travel.
   e. Creighton Bell (CB), of the BPAC, stated that the butterfly arch is aesthetically pleasing and that the deck should be as wide as possible, since social distancing behavior will continue. CB added that flat areas with benches to rest are essential.
   f. Tramaine Austin-Dillon (TAD), of the PC, believes that the overcrossing would be a great opportunity to involve Sonoma State University and provide branding, since students often talk about Rohnert Park as not being a college town. TAD added that bicycle safety is important, and believes the project should consider how to add bike racks so people can stop to enjoy the trails, as well as consider how e-bikes and scooters would travel along the trails.
   g. CS likes both the butterfly arch and single arch, with no preference for either. CS agreed with TAD and identified Sonoma State and the Tribe as part of the City's diverse community, for which to cast a wide net to identify cultural and aesthetic motifs that could be incorporated into the project's design.
   h. FL likes the butterfly arch and envisions that the overcrossing would be landmark in future. FL asked if there is a disadvantage to designing the traveled way with 14 feet of width instead of 12 feet.
      i. SG stated that 14 feet would result in slightly more shade onto the creek, a slightly heavier structure, and slightly more cost, but it would be feasible. SG added that 14 feet is the Caltrans Highway Design Manual's recommended width for bike/ped overcrossings, even though the manual allows for so-called pedestrian-only overcrossings to be eight feet wide. SG stated that the established current best-practice minimum is 12 feet for bicycle and pedestrian facilities, and subtle tradeoffs between 12 or 14 feet would have to be studied more carefully in future phases.
   i. MO agreed with many previous remarks about liking the butterfly arch design and added that lighting should be added to enhance both aesthetics and safety. MO agreed with TAD in regards to opportunities for branding. According to MO, who frequently bikes in the City, many people use adult tricycles, which may be benefited by a wider path.
   j. Ed Chasco, of the Rohnert Park Parks and Recreation Commission, asked if there would be different maintenance requirements between Alternatives A or B.
      i. SG stated that the differences can not be identified at this stage, but specifics could be determined with further study in future phases.

8. Attendees
   a. Rohnert Park Planning Commission
      i. Marc Orloff
      ii. Fanny Lam

iii. Tramaine Austin-Dillon
iv. Chuck Striplen

b. Rohnert Park BPAC
   i. Tim Hensel
   ii. Creighton Bell
   iii. Gary Gutierrez
   iv. Kimberly Finale

c. Rohnert Park Parks and Recreation Commission
   i. Ed Chasco

d. Rohnert Park Staff
   i. Jennifer Sedna
   ii. Jeffrey Beiswenger
   iii. Vanessa Garrett
   iv. Eydie Tacata
   v. Mary Grace Pawson
   vi. Mike Son

e. SGA
   i. Steven Grover
   ii. Oscar Tsai
   iii. Jimmy Darling

ROHNERT PARK
HIGHWAY 101 BIKE AND PEDESTRIAN CROSSINGS
FEASIBILITY STUDY

Online Public Workshop - Summary and Notes
Thursday, May 6, 2021, 6:00-7:05 PM
Online Meeting - Zoom Webinar

Workshop Publicity
On April 5, 2021, a notification flyer (attached) was published in the City of Rohnert Park's Senior Center Newsletter to inform readers about the Feasibility Study and that an online Public Workshop would be conducted in May. A shortened web address (bit.ly/RohnertPark101BikePedCrossing) was included in the flyer to direct readers to the project webpage on the City's website.

On April 23, a weekly column in the Community Voice print and online newspaper featured Mary Grace Pawson (MGP), the City's Director of Development Services. The Community Voice serves the Rohnert Park and Cotati area, and is mailed to homes and businesses every Friday for an annual subscription fee. According to the Community Voice, it is the largest community newspaper in Sonoma County, with over 8,000 copies in circulation each week.

In her column, MGP discussed how the Feasibility Study seeks to address the barrier created by US 101 to bike/ped access and encouraged readers to join the online Public Workshop to learn about the study's findings and provide feedback. The column provided the Workshop's date and time and a link to the project webpage.

On April 26, invitation flyers (attached) encouraging recipients to register and attend the Workshop were posted to the "Community Spotlight" section on the City's main webpage and project webpage. A a shortened web address was included to allow easier access to the registration page (bit.ly/RohnertParkWorkshop). The Workshop registration page included project information in both English and Spanish and encouraged anyone needing language assistance to email SGA Architecture and Engineering 48 hours in advance of the event. As part of the registration process, registrants were asked to input their city of residence and the city in which they worked. A confirmation email in both English and Spanish was sent to registrants with a link to the Workshop and a reminder to notify SGA 48 hours before the event to request language assistance.

The invitation flyer was also sent to Jon-Paul Harries, Senior Planner and Bike/Ped Lead for the City of Cotati; Julia Gonzales, Assistant Vice President for Strategic Communications of Sonoma State University; and Eris Weaver, Executive Director of the Sonoma County Bicycle Coalition,

all of whom SGA had been in contact with, to spread the word about the Workshop via any bike/ped email lists, social media outlets, or webpages.

On April 30, City staff distributed the invitation flyer through email blasts to its Bicycle and Pedestrian and Traffic Update email lists, and an invitation flyer was also sent to the Rotary Club of Rohnert Park-Cotati.

On May 3, the invitation flyer was also published in the City's Senior Center Newsletter, and posted to the City's Facebook, Twitter, and Nextdoor social media pages. Prior to the Workshop, the Facebook post had been shared 13 times, and the Twitter post was retweeted twice, both of which included shares by Sonoma State University.

In the week prior to the Workshop, SGA was in communication with the property managers of several affordable housing communities in the study area to post flyers about the workshop and/or help advertise the workshop electronically. Communities contacted include the Copeland Creek Senior Apartments, Altamont Senior Apartments, Edgewood Apartments, Muirfield Apartments, Rancho Feliz Mobile Home Park, and Burbank Housing.

On the morning of May 6, the day of the Workshop, the City reposted the invitation flyer to its Facebook page, which was shared once, with a reminder to followers that the Workshop was happening that evening. Based on Bitly records, the Workshop registration link received 87 clicks from unique sources between April 12 and the Workshop. SGA did not receive any requests for language assistance.

Workshop Format

The online Public Workshop for the City of Rohnert Park's Feasibility Study for a new bicycle and pedestrian crossing of US 101 was conducted on May 6, 2021, at 6:00 PM, using Zoom Webinar. Key individuals and Panelists were:

1. Vanessa Garrett, City of Rohnert Park — Panelist
2. Eydie Tacata, City of Rohnert Park — Panelist
3. Jeffrey Beiswenger, City of Rohnert Park — Panelist
4. Steven Grover, SGA — Panelist and Main Speaker
5. Jimmy Darling, SGA — Panelist and Administrator
6. Oscar Tsai, SGA — Panelist and Host

Oscar Tsai (OT) opened the Workshop and introduced Vanesa Garrett (VG) to provide opening remarks. OT reviewed the meeting format and interactive polling feature by asking attendees to respond to a poll question about their prior knowledge of the study. OT then introduced Steven Grover (SG) to give the main presentation. During the presentation, which lasted approximately 30 minutes, attendees were asked to respond to four poll questions pertaining to the crossing's location, anticipated usage, preferred design, and project importance. Questions and comments about the project that were typed in the Chat during the

presentation and poll questions were answered during the question and answer portion of the Workshop, while requests for technical assistance (e.g., volume issue) were answered immediately via reply messages in the Chat.

The presentation and polling session was followed by a question and answer period, moderated by OT, which lasted approximately 30 minutes. At the start of the question and answer period, OT introduced Eydie Tacata and Jeffrey Beiswenger of the City to join VG and SG and instructed attendees to click "Raise Hand" or the hand icon if they have a question to be called on to speak. Attendees were also able to type their questions and comments in the Chat. Call-in attendees were instructed to press *9 to raise their hand. OT stated that the poll results would be shared with the presentation slides and workshop recording on the project webpage.

Questions typed in the Chat were read by OT and responded to by Panelists. Attendees were asked to raise their hand if they wished to provide clarification or follow-up questions verbally. Attendees who raised their hand were called on by OT and asked to unmute themselves before asking their question. In some cases, Panelists responded verbally to a typed question or comment in the course of responding to a separate but related question.

OT closed the question and answer period after receiving no more typed questions or raised hands. OT asked VG was asked to provide closing remarks before concluding the Workshop at 7:05 PM and inviting attendees to visit the project web page in the coming days to access the presentation slides, Workshop recording, and poll results.

Questions and Comments

1. Maria Hensel
    a. [Via Chat, read by OT] Why not allow the approach to also cross over Commerce Blvd.?
        i. SG stated that crossing over Commerce was assessed and determined to result in greater costs and more visual impacts due to more structure and significant overhead utilities that would have to be relocated. Therefore, landing on the west side to connect to the existing north-south pathway and developing a new HAWK signal across Commerce Boulevard appears to be the best choice.
    b. Maria followed up verbally with the comment that many people do not stop at a HAWK even if it is illuminated, so the proposed design guides people into a crosswalk that may not actually be safe. Maria stated it would be worth exploring crossing Commerce further and believed that conflicts with utilities can be removed. Maria added that many cyclists would not want to unclip to use the crosswalk.

c. [Via Chat] I suggest the City consider paving that allows for infiltration of groundwater or minimizing paved areas. Also plant trees in place of those removed.
   i. SG stated that the proposed design makes provision for both biofiltration areas and new tree planting to replace the trees that would be removed.

2. Neil Hancock
   a. [Via Chat, read by OT] Could you also discuss which is better for sight lines - that is a safety visible on sloped parts before entering.
      i. SG stated that both alternatives would provide for good sightlines, especially because no fencing is required on the approaches, which would obstruct signlines when viewed from an acute angle. Instead, the approaches would have railings approximately 48 inches high. SG added that for Alternative A, with very large radius curves on the approaches, users would have adequate visibility of other people, well before they met.
   b. Neil followed up verbally and agreed that based on the visualizations, Alternative A did appear to provide for better visibility and safety sightlines.
      i. SG added that with Alternative A's butterfly arches that lean outwards, it would provide better sightlines and a sense of openness on the main span, as compared to fencing that is vertical or inward-leaning.
   c. Neil stated that he serves on the Cotati Planning and Bike/Ped Commission and is attending as a private citizen. He is a regular cyclist, often riding to Sebastopol and back, and has used the culvert in the past. He stated that the area where Rohnert Park and Cotati connect at Copeland Creek on the west side of US 101 is very tight and existing conditions do not facilitate bike/ped travel very well in the north-south direction into and from Cotati. He stated that crossing over to Cotati using an overpass would be absolutely fantastic. Neil pointed out that along Redwood Drive, there is a Class II bike lane in the southbound direction, but not in the northbound direction, and there is no good way for a cyclists to get onto the Copeland Creek Trail. Neil recalled that there had been discussion in the past about adding a new bike/ped bridge in the north-south direction over Copeland Creek.
      i. Using on-screen annotations, SG explained that as part of this project the Study also recommends extending the culvert at Redwood Drive over Copeland Creek to provide shoulder space for vehicles, as well as a wide sidewalk for cyclists and pedestrians traveling north-south. SG added that a culvert extension is also proposed on the east side, along Commerce Boulevard, to provide shoulder room and a wide sidewalk and pathway. The existing and narrow truss footbridge would be removed and replaced with the cleaner solution of the wide sidewalk.

3. Eris Weaver

   a. Eris stated that she is the Executive Director of the Sonoma County Bike Coalition and bikes in the study area very frequently, since she lives in the study area. Eris stated that she loves the butterfly arch design and imagines that the overrossing would be very well used, since it provides a such a short route from one side of the freeway to the other, as compared to the current route, which is very circuitous. Eris stated that she currently has to use the School Street (Sierra Ave.) underpass to cross US 101, since all the other options are so lousy. She stated that she is very excited for this project and hopes that she doesn't have to wait until this project is started before Rohnert Park develops the new HAWK signal. She stated that traveling west on the Copeland Creek Trail, she currently has to ride south on the Commerce Boulevard sidewalk to get to the crosswalk at Avram Avenue, which is not ideal and contrary to how people are taught to ride.
   b. [Via Chat] You might want to define hydraulic capacity, not everyone might know what that means
      i. SG clarified that when inadequate hydraulic capacity was mentioned during the presentation in regards to the existing culverts under US 101 at Hinebaugh Creek and Copeland Creek, what he meant was that the culverts are undersized. Therefore, the culverts do not allow water to pass though well enough, leading to the flooding issues present at those locations. SG added that any additions to improve the culverts by providing lighting or railing inside, would decrease the capacity for water to flow through them.

4. Kimberly Finale
   a. Kimberly stated that although she is on the City's BPAC, she is speaking as a private citizen, and asked if or how this project is tied to the roundabout project at Commerce Boulevard and Southwest Boulevard. Kimberly added that this project would add a very nice entrance into this part of the City and add to the appeal of the area.
      i. VG stated that the City is taking the opportunity to get bike/ped synergy between the two projects, but the timelines are different. The roundabout will likely start construction within a year, while the overcrossing project would take a few years, and the City is looking into grant funding opportunities to support this project down the road.

5. Laurie Alderman
   a. [Via Chat, read by OT] Could instead of crosswalk, could there be a barrier on the west of commerce that would help people go to Avram instead of crossing there?
      i. OT stated that there are maintenance roads that run parallel to the creek, which Sonoma Water uses to perform creek maintenance, so any barriers that would prevent people from crossing Commerce Boulevard

at Copeland Creek, would also prevent Sonoma Water from accessing their maintenance roads.

b. Laurie followed up verbally and acknowledged that Sonoma Water would be upset if their access to the maintenance roads was blocked.
c. [Via Chat, read by OT] I was wondering with all the trees, etc. if the fire risk has been considered, i.e. the people on the walkway smoking and lighting the trees on fire?
    i. SG thanked Laurie for the comment.

6. Joe Gaffney
    a. [Via Chat, read by OT] The HAWK has to be synchronized with the signal at Avram.
        i. OT stated that the HAWK would be synchronized with the signal at Avram.
    b. [Via Chat, read by OT] How will the 180 turn west of the fwy in Alt A affect Sonoma Water's ability to maintain the channel?
        i. SG stated that a couple of meetings have been conducted with Sonoma Water, particularly with the individuals who are in charge of creek maintenance. Therefore, the team was able to learn exactly what type of vehicles are required for maintenance and to define the geometrics to accommodate them. Using on-screen annotations, SG pointed out in the visualizations where full-scale dump trucks, as required by Sonoma Water, were added to the 3D model to ensure space for access. SG added that the team also made sure that there would be space under the structure, so that Sonoma Water had sufficient access to perform occasional dredging.
7. C. L. Sherman
    a. [Via Chat, read by OT] How does construction affect the safety of the homeless community?
        i. SG stated that it is important to work into future specifications and bid documents for the eventual construction contract, the protection of natural habitat, trees, water, homeless, and anything else, which would be included in any future draft bid documents. SG added that while it is very early to be talking about construction, it never hurts to be aware of these issues early on.
8. Leo Tacata
    a. Leo stated that although the proposed HAWK is safer than what is there now, that area has very aggressive drivers, bikers, and pedestrian, and cyclists will regularly blow through the trail and cross Commerce Boulevard, because that is just the nature of the street. Leo wondered if there was a way to reengineer the trail to end at Avram Avenue. He added that while the HAWK is safer, it would still attract a population that will be very risky, and although it is very hard to see through the area when the light is low, it doesn't stop people from engaging

in risky behaviors. Leo stated that regardless of whether they are walkers, bikers, or drivers, the reality is that everyone wants to get through this part of the city as fast as they can.

b. [Via Chat, read by OT] I think if this bridge gets built that the culvert be blocked from passage. It's not a safe option to keep open.
    i. OT stated that closing access to the existing culverts could increase the buildup of debris and exacerbate flooding issues. SG added that it is very challenging to prevent access to a culvert in a way that also allows water to pass through it freely.

9. Additional Comments Typed in the Chat
    a. Stefan Stehling: further north serves Santa Rosa residents better
    b. Leo Tacata: I do not like the hawk. That area will always have aggressive drivers, bikers, and peds. I'd recommend shutting off the current Copeland creek trail and routing the trail through Avram.
    c. Stefan Stehling: flashing lights embedded in the street along the crosswalk are highly visible
    d. Eris Weaver: We need that HAWK at Commerce & Copeland Creek NOW!
    e. James Heisey: In any design I would prefer to see a separate pedestrian lane to avoid cyclist/pedestrian conflicts.

Attendees and Poll Results

Excluding panelists, twenty-six people registered for the Workshop, and 18 attended. Eleven attendees stated that they live in Rohnert Park, while 12 work in Rohnert Park. Four attendees neither live nor work in Rohnert Park, but of those four, three either live or work in area (i.e., Santa Rosa, Cotati, Penngrove), and one was located in the Concord area.

Based on the Workshop's poll results, approximately half of respondents completed a survey about the Feasibility Study or attended a previous meeting about it. The remaining half were divided among those who were either hearing about the Study for the first time, or who only heard it mentioned in the past. When asked where a new bike/ped crossing should be located if the City chooses to move forward, 81% chose Copeland Creek. If an overcrossing were built, 67% anticipated that it would be well used, and 28% thought that it would be lightly used. Regarding the design of the overcrossing, 63% preferred the butterfly arches, gentle approach slopes on both sides, and circular touchdown plaza on the east side. No respondents chose the concrete box girder. Finally, 94% of respondents expressed that a new bicycle and pedestrian overcrossing of US 101, to improve connectivity between the east and west sides, would be important for the City, provided that outside funding is used.

http://bit.ly/RohnertPark101BikePedCrossing

Rohnert Park HIGHWAY 101 BIKE & PEDESTRIAN CROSSING

measure M sales tax at Work

PROJECT INFORMATION

The City is currently developing a **Feasibility Study** for a new bicycle and pedestrian crossing of US 101 to enhance safety and circulation. The Study evaluates several potential crossing locations and alignments and makes design recommendations. Compared to existing freeway crossings at Rohnert Park Expressway and Golf Course Drive, a new bike/ped crossing would provide pedestrians and cyclists with a safer alternative for crossing US 101 in the vicinity of transit, businesses, and offices. The crossing would provide a continuous ADA-compliant Class I path that improves east-west connectivity and connects to the existing bike/ped network.

Please visit the Project Webpage at: http://bit.ly/RohnertPark101BikePedCrossing for more information, and stay tuned for details about an **Online Public Workshop in May** to learn about Study's findings and to provide feedback.

CONCEPTUAL DESIGNS

Butterfly Arch Concept

Single Arch Concept

Touchdown Plaza Concept

Widened Sidewalk Concept

You're invited!

ONLINE PUBLIC WORKSHOP

HWY 101 BICYCLE & PEDESTRIAN CROSSING PROJECT

Thursday, May 6th at 6:00 PM

Register at: bit.ly/RohnertParkWorkshop

Please join the City of Rohnert Park at an online Public Workshop to learn about and provide feedback on a **Feasibility Study** for a new **Highway 101 Bicycle and Pedestrian Crossing**. This Study evaluates alternatives for a new car-free crossing of US 101 to provide a safer and more accessible route between the east and west sides of Rohnert Park.

Butterfly Arch Concept

Single Arch Concept

For more information, visit the Project Webpage at: bit.ly/RohnertPark101BikePedCrossing

ITEM NO. 7.A.

Mission Statement

"We Care for Our Residents by Working Together to Build a Better Community for Today and Tomorrow."

CITY OF ROHNERT PARK
CITY COUNCIL AGENDA REPORT

Meeting Date: October 26, 2021

Department: Public Works

Submitted By: Vanessa Marin Garrett, Director of Public Works

Prepared By: Vanessa Marin Garrett, Director of Public Works

Agenda Title: **Review of the Highway 101 Bicycle and Pedestrian Overcrossing Feasibility Study (Project 2017-20) Location Recommendation at Copeland Creek (Project 2017-20), Discussing Landing Layouts, and Discussing Bridge Aesthetics and Budget**

RECOMMENDED ACTION: Review of the highway 101 bicycle and pedestrian overcrossing feasibility study location recommendation at Copeland creek (Project 2017-20), discussing landing layouts, and discussing project aesthetics and budget

BACKGROUND: For many cities and towns crossed by major highways, the lack of safe and comfortable crossings is a significant barrier to walking and biking between separated city areas. The Rohnert Park General Plan recognizes this, and while acknowledging the City's original orientation toward automobiles, both the General Plan and Rohnert Park Bicycle and Pedestrian Master Plan call out the need to improve non-motorized connectivity between east and west Rohnert Park.

As a masterplan community, the City of Rohnert Park was developed as a collection of residential neighborhoods. All of these neighborhood have access to bicycle routes, either along public streets or along creeks that connect neighborhoods and create a robust network of bicycle (and pedestrian routes). One significant bicycle facility is the Copeland Creek multi-use path. The facility is particularly important for east-west connectivity and is well used. As the General Plan envisioned and as the feasibility study revealed, a crossing where Copeland Creek and Highway 101 intersect enhances east-west connectivity.

In 2018, the City entered into a cooperative agreement with the Sonoma County Transportation Authority (SCTA) for $255,000 in Measure M grant funding, with a $20,000 local match, to complete a feasibility study for a bicycle and pedestrian crossing across highway 101 in Rohnert Park. The study is funded through an allocation of funding from the Bicycle & Pedestrian Projects Program of the Sonoma County Traffic Relief Act ("Measure M"), a ¼ cent sales tax for transportation. After circulating a request for proposals, staff determined that the most qualified consultant to complete the study is Steven Grover and Associates (SGA). On April 24, 2020, the City Council awarded a consultant agreement to SGA to complete the feasibility study (Study).

The purpose of this Study is to evaluate potential locations and alignments for a highway 101 crossing that would meet the needs of the community and enhance an area of the City. The

ITEM NO. 7.A.

crossing alignment must be safe, convenient, and competitive in future funding opportunities such as grants.

The major tasks that are included in the consultant's scope of work are:

- TASK 1: Document existing plans and policies that support the development of bicycle/pedestrian crossings of Highway 101;
- TASK 2: Survey existing and potential locations and alignments for bicycle/pedestrian crossings;
- TASK 3: Examine available and projected travel demand data; identify types of walking, biking and other non-car trips across and through Rohnert Park; and assess a wide range of safety factors from collision history to personal security and public health;
- TASK 4: Develop recommended and preferred alignment alternatives, considering the potential environmental, engineering, operational and permitting issues associated with each alignment;
- TASK 5: Provide planning level project costs of alignment alternatives; and
- TASK 6: Provide a report outlining next steps and considerations for the permitting, environmental clearance, design, and funding of the preferred crossing alignment(s).

ANALYSIS: SGA has performed a thorough investigation to consider several potential locations that bicyclists and pedestrians could utilize safely to cross highway 101. After performing initial investigative work, they determined that the crossings shown in Attachment 1 and further described below are the most appropriate to further analyze:

- Golf Course Drive: Further enhancing the existing connection along Golf Course Drive
- Business Park to State Farm Drive: a connection from the State Farm Drive/ Commerce intersection to the Redwood Drive/ Business Park Drive intersection
- Industrial Park to Commerce Blvd: a connection from Redwood Drive near Scandia to Commerce Blvd. near Professional Center Drive
- Hinebaugh Creek: a connection from the western side of the creek to the eastern side (both over and undercrossings were explored)
- Rohnert Park Expressway: further enhancing the existing connection along Rohnert Park Expressway
- Copeland Creek: a connection from the western side of the creek to the eastern side (both over and undercrossings were explored)
- Section A to Cotati: connecting from Redwood Drive within the City of Cotati limits to Commerce Blvd./ Southwest Blvd. in the City of Rohnert Park

As part of the feasibility investigation, SGA performed public outreach during the summer of 2020, soliciting feedback via a survey from the community regarding preferences, habits, and opinions about riding and walking through the City. Staff and SGA also met with agency stakeholders regarding project planning and engineering feasibility. Stakeholders included:

- Caltrans
- Sonoma Water Agency

- Bicycle and Pedestrian Committee
- Planning Commission
- Public Community Meeting

After reviewing stakeholder input, alignment geometries, and engineering documentation, the recommended option that appears to be most feasible is the Copeland Creek overcrossing alignment. During the resident surveys, it was apparent that the main reason for bike and pedestrian use is for recreation. Copeland Creek bridges each side highway 101 with extended bike and pedestrian trails. Potential alignments for Copeland Creek are shown in Attachment 2. Designs 1 and 2 consist of cloverleaf approaches on the west side of the overcrossing with a gradual transition through trees near the multiuse pathway of Commerce Blvd. on the east side of the ramp. Design 3 has a more rapid on and off ramp with cloverleaf transitions on both the west and east side of highway 101.

STRATEGIC PLAN ALIGNMENT: The recommended action is consistent with Strategic Plan Goal D (continue to develop a vibrant community). A feasibility study to determine the needs of the City is a first step in making improvements to enhance bicycle and pedestrian transportation projects.

FISCAL IMPACT/FUNDING SOURCE:

Estimated Project Costs and Variables

Long-term fiscal impacts of this project will be significant, with an estimated project cost of $30 million to complete the entire project. The following is a conceptual estimate of the bridge at the Copeland Creek Crossing location with associated timeline:

Phase	Estimated Cost	Estimated Completion Date
Overcrossing Project Initiation	$ 450,000	2022
Overcrossing Environmental	$ 700,000	2024
Overcrossing PS&E	$ 2,700,000	2025
At-Grade Improvements	$ 800,000	2027
Overcrossing Construction	$ 21,200,000	2027
Agency Support	$ 4,150,000	2027
Total Project Cost	$ 30,000,000	

*PS&E: Plans, specifications, and estimate

Each of the three alignments in Attachment B will have varying costs and several components that are fixed costs such as the bridge deck thickness and structural components. The bridge can be scaled in terms of aesthetics, and staff recommends including this as a scalable factor to make the bridge economical. All three alignments are appropriate at that location, and staff recommends investigating further which is the most cost effective option during the project initiation phase and moving forward with that option.

Funding Strategy

For this project, staff's intention is to apply for grant funding for all project components except for the first component- the project initiation phase ($450,000), which is a planning document needed to put forward competitive transportation grant applications. Staff does not recommend fully

funding the project through city funds. The recommended strategy is to invest local funds in creating a competitive grant package, and work towards securing other funds for the design, environmental, and construction portions of the project. This type of project is also a good candidate for regional sources geared towards bicycle and pedestrian transportation, and this funding approach has been proven as a successful strategy historically and recently with the City of Santa Rosa's now fully funded overcrossing project between Steele Lane and College Avenue.

Next Steps

The next step is to put together the project initiation document. The project initiation document is slated to utilize local funds during fiscal year 21-22 as a Capital Improvement Program project. Staff recommends performing this next step because competitive grant applications will require this document to be complete, as well as significant public outreach. It will also further define the costs of the next phase of the project.

OPTIONS CONSIDERED:

- Option #1 (Staff recommended option): Direct staff to move forward with the Copeland Creek location as the selected location, direct staff on any alignment preferences (if any), and direct staff to work towards the most economical crossing design in the next steps.
- Option #2: Direct staff to move forward with the Copeland Creek location as the selected location, and direct staff to focus more on aesthetics over producing the most economical crossing design.
- Option #3: Direct staff to look further into other crossing locations. Staff will then proceed in further evaluating a different location and will come back to council with modified concepts. This option may cause the need for an amendment with SGA's contract to perform additional scope.

Department Head Approval Date: 10/05/2021

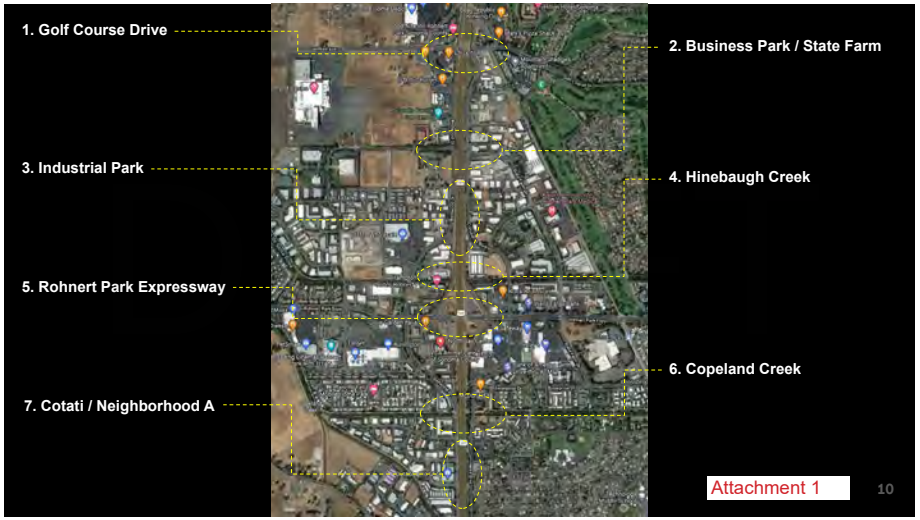
City Attorney Approval Date: 10/12/2021

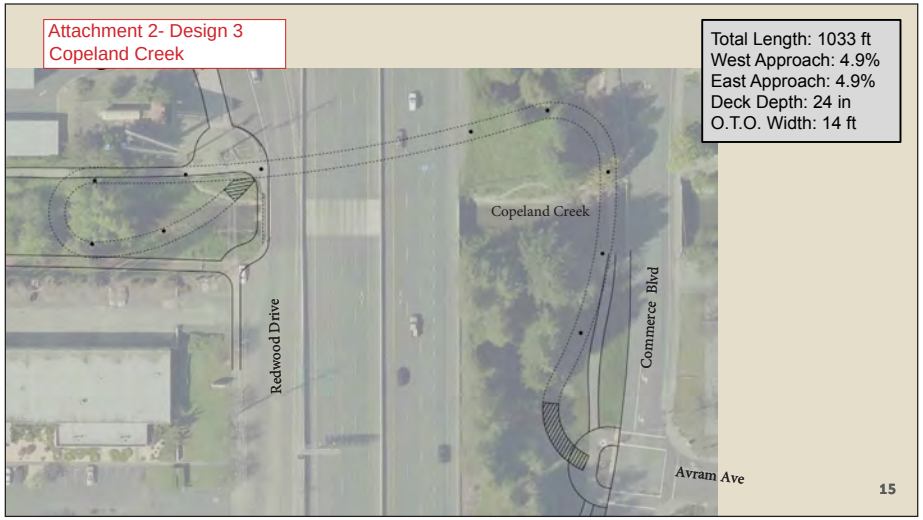
Finance Director Approval Date: 10/12/2021

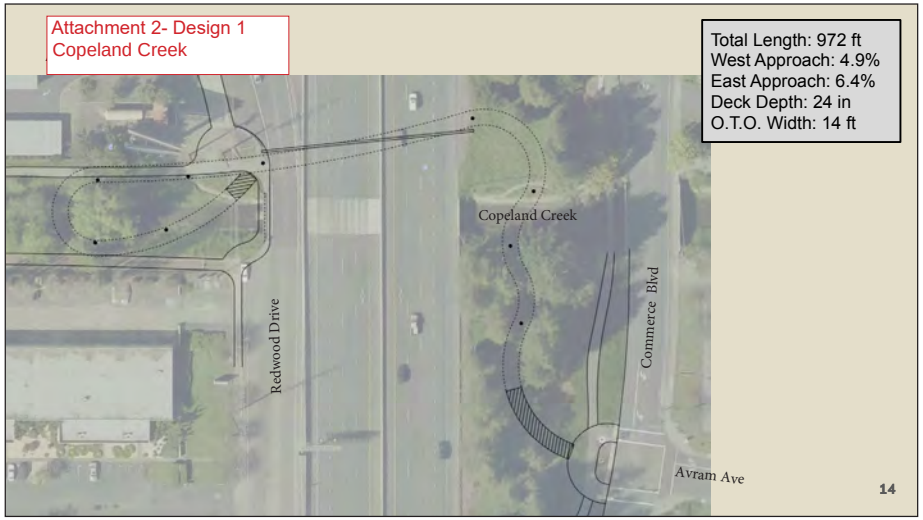
City Manager Approval Date: 10/21/2021

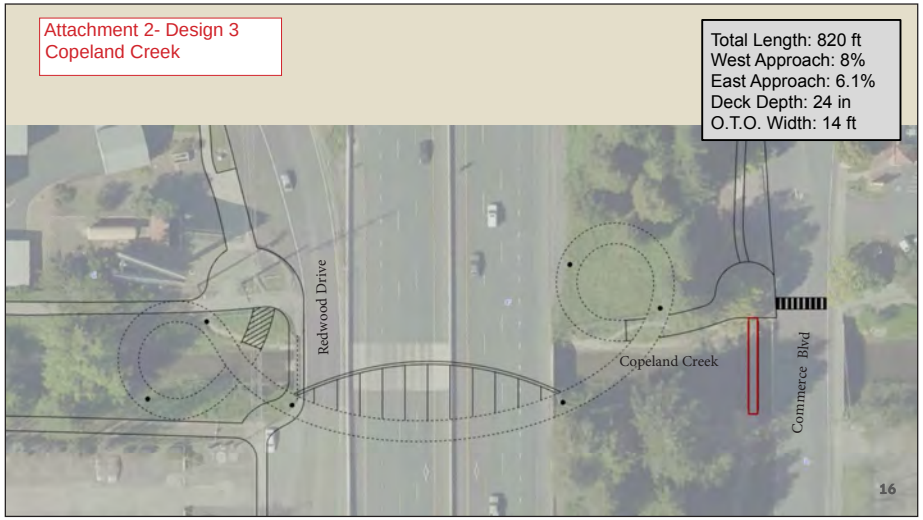
Attachments:

1. Crossing Locations Studied
2. Copeland Creek Alignment Options


1. Golf Course Drive
2. Business Park / State Farm
3. Industrial Park
4. Hinebaugh Creek
5. Rohnert Park Expressway
6. Copeland Creek
7. Cotati / Neighborhood A
Attachment 1
10


Attachment 2- Design 3
Copeland Creek
Total Length: 1033 ft
West Approach: 4.9%
East Approach: 4.9%
Deck Depth: 24 in
O.T.O. Width: 14 ft
Copeland Creek
Redwood Drive
Commerce Blvd
Avram Ave
15


Attachment 2- Design 1
Copeland Creek
Total Length: 972 ft
West Approach: 4.9%
East Approach: 6.4%
Deck Depth: 24 in
O.T.O. Width: 14 ft
Copeland Creek
Redwood Drive
Commerce Blvd
Avram Ave
14


Attachment 2- Design 3
Copeland Creek
Total Length: 820 ft
West Approach: 8%
East Approach: 6.1%
Deck Depth: 24 in
O.T.O. Width: 14 ft
Redwood Drive
Copeland Creek
Commerce Blvd
16

Funds and Stating Assurance to Complete the Southwest Boulevard Complete Streets Implementation

6.J Adopt Resolution 2021-127 Adding a Full-Time Custodian Position and Removing One Part-Time Custodian and One Part-Time Project Coordinator Position from the City of Rohnert Park Adopted Budget Fiscal Year 2021-2022 in the Public Works Department

6.K Adopt Resolution 2021-128 Authorizing City Manager to Execute a Lease Agreement Between the City of Rohnert Park and Myles Ahead Fitness, Inc. for use of the Activity Room at the Callinan Sports and Fitness Center

6.L Adopt Resolution 2021-129 Authorizing the City Manager to Apply for Federal Grant Funding for the Water Meter Installation Project as Defined in the Bureau of Reclamation Grant Application

6.M Authorize the City Manager to Execute Amendment No. 1 to Task Order 2021-01 with Iteris, Inc. for Design Services in Amount of $19,999 for the Bicycle and Pedestrian Safety Improvements Project (Project 2020-28)

6.N Acceptance of Code Compliance Third Quarter 2021 Report (July, August, and September 2021)

ACTION: Moved/seconded (Stafford/Linares) to approve the consent calendar with the exception of 6.F.

Motion carried by the following 5-0-0 vote: AYES: Adams, Linares, Stafford, Elward, and Giudice, NOES: None, ABSTAINS: None, ABSENT: None.

6.F Adopt Resolution 2021-123 Approving Amendment 1 to a Consultant Services Agreement with 4Leaf Inc for Building Plan Check and Inspection Services and Related Actions

ACTION: Moved/seconded (Adams/Stafford) to accept Item 6.F.

Motion carried by the following 5-0-0 vote: AYES: Adams, Linares, Stafford, Elward, and Giudice, NOES: None, ABSTAINS: None, ABSENT: None.

Mayor Giudice declared a recess to the Ribbon Cutting for SAFE Team Mobile Crisis Van located in the City Hall parking lot at 5:25 p.m.

Mayor Giudice reconvened the meeting at 5:55 p.m.

7. REGULAR ITEMS

A. Review of the Highway 101 Bicycle and Pedestrian Overcrossing Feasibility Study (Project 2017-20) Location Recommendation at Copeland Creek (Project 2017-20), Discussing Landing Layouts, and Discussing Bridge Aesthetics and Budget
Director of Public Works Garrett and Steven Grover, Consultant, Steven Grover and Associates presented this item. **Recommended Action(s):** Review of the highway 101

bicycle and pedestrian overcrossing feasibility study location recommendation at Copeland creek (Project 2017-20), discussing landing layouts, and discussing project aesthetics and budget.

PUBLIC COMMENTS: None.

ACTION: By consensus (none opposed), Council directed staff to move forward with the Copeland Creek location, "Butterfly" bridge design, project initiation document, and to seek grant funding for the project.

ACTION: Moved/seconded (Stafford/Linares) to reorder agenda to have Item 7.C. moved to before 7.B.

Motion carried by the following 5-0-0 vote: AYES: Adams, Linares, Stafford, Elward, and Giudice, NOES: None, ABSTAINS: None, ABSENT: None.

C. Time Certain 6:30 p.m. PUBLIC HEARING (Noticed: October 15, 2021): First Public Hearing to Receive a Report Providing Information Regarding the Redistricting Process and Receive Input on Composition of Districts
City Manager Jenkins and Demographer Michael Wagaman presented this item.
Recommended Action(s): Receive a report providing information regarding the redistricting process and conduct a public hearing to receive input on composition of districts.

Public Hearing Opened: 7:06 p.m.

PUBLIC COMMENTS: Jim Duffy, Chris Borr, Julie Royes, and Chris Meyer spoke about this item.

Public Hearing Closed: 7:14 p.m.

Mayor Giudice declared a recess at 7:14 p.m.

Mayor Giudice reconvened the meeting at 7:26 p.m.

ACTION: By consensus (none opposed), Council directed staff to conduct a community workshop about the community of interest and mapping tools without Council present on December 4 or 11 at 10 a.m. at the Community Center or Council Chambers.

B. Discussion and Direction on City's Preliminary Water Rate Study Findings
Finance Director Bali and Mark Hildebrand, Consultant with Hildebrand Consulting, presented this item. **Recommended Action(s):** Discussion and direction on initial findings for the City of Rohnert Park's (City's) water rate study and proposed water rate increases.

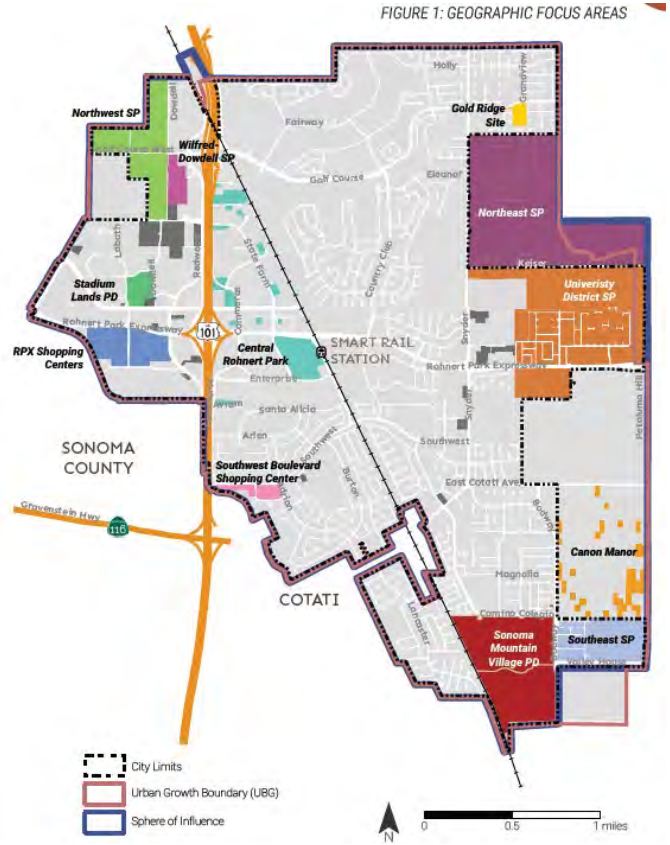
PUBLIC COMMENTS: Paul Libeu spoke about this item.

FEHR PEERS

Alternatives Accessibility Analysis

The graphics on the following pages present how access between households, jobs, and key destinations in the study area would change with each crossing alternative – Hinebaugh Creek compared to Copeland Creek – and with implementation of the currently proposed Rohnert Park General Plan Update (GPU). The destinations assessed reflect "Geographic Focus Areas" identified as part of the ongoing General Plan update process (see inset figure at right) within the study area of the two crossing alternatives:

- Stadium Lands Planned Development
- Rohnert Park Expressway (RPX) Shopping Centers
- Rohnert Park SMART Station & Central Rohnert Park



Methodology

The GIS accessibility analysis was conducted using Open Street Map (OSM) data to build a pedestrian and bicycle network and evaluate accessibility for the two crossing alternatives – Hinebaugh Creek and Copeland Creek. The analysis relied on the following assumptions about how each mode would traverse the network:

- Walking: pedestrian access was analyzed based on a walking speed of three miles per hour and walking time along either side of the roadway. The analysis considers different routes people can walk (rather than "as the crow flies"). Highways were excluded from the set of potential routes.

- Biking: bicycle access was assessed similarly and also considers level of traffic stress (LTS).[i] The analysis assesses biking time based on a speed of ten miles per hour on low-stress segments and three miles per hour on high-stress segments, reflecting a preference for low-stress routes. Highways were excluded from the set of potential bicycling routes. For the future analysis, bikeways proposed as part of Sonoma County Transportation Authority's (SCTA) 2014 Countywide Bicycle and Pedestrian Master Plan were incorporated in the bicycle network.

Using the walking and biking network developed for existing and future conditions, walk and bike accessibility analyses were performed for each of the two proposed crossing alternatives across US-101, at Hinebaugh Creek and Copeland Creek. The access sheds developed for specific walking and biking times (between 10 and 25 minutes) were compared to household and employment data (existing and future) to estimate the number of households and jobs accessible within certain travel time sheds under existing and future conditions. The existing access analyses for both walking and biking considers existing households and employment estimates for Rohnert Park, as well as households in Cotati that are covered by access sheds. The future access analyses overlays the household and employment growth proposed as part of the ongoing Rohnert Park General Plan Update effort on the existing data.

Findings

Overall, future access between households, jobs, and key destinations increases with both the Hinebaugh and Copeland Creek alternatives compared to existing conditions, as shown in the graphics. Of note, future access estimates rely on the proposed connection of the Hinebaugh Creek Trail across SMART and Foxtail Golf Club, which is included in SCTA's proposed bikeway dataset; future accessibility with the Hinebaugh Creek alternative would be reduced without this connection. The assessment also revealed that future access along Copeland Creek Trail could be improved with minor enhancements, such as implementing "low-stress" walking and biking facilities on Redwood Drive or improving trail connections to the RPX Shopping Centers near Laguna Drive. Since the Copeland Creek trail crosses the entire city, and connects with a trail through A and B Sections to provide access to residents in southeast Rohnert Park, it generally provides greater connectivity than the Hinebaugh Creek trail, which is currently interrupted at SMART. Prioritizing the Copeland Creek Trail crossing may also improve equity outcomes since it more directly serves Sections A, B, and C, including the Rancho Feliz and Rancho Verde mobile home parks.

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[i] Level of Traffic Stress (LTS) analysis helps planners understanding how well a bicycle network accommodates bicyclists of all ages and abilities by evaluating roadway and bikeway characteristics that can cause stress for the typical cyclist (e.g., auto speeds, number of travel lanes, bikeway protection). Low-stress facilities such as trails, protected bikeways, or bicycle boulevards are more comfortable for a wider range of bicyclists, compared to higher stress facilities like narrow bicycle lanes on an arterial roadway with fast moving traffic. Learn more about Mineta Institute's LTS methodology here: https://transweb.sjsu.edu/research/Low-Stress-Bicycling-and-Network-Connectivity

Expanded Accessibility with a New US-101 Bike & Pedestrian Crossing

How would access to the **RPX Shopping Centers** change with a new crossing at Hinebaugh or Copeland Creek?

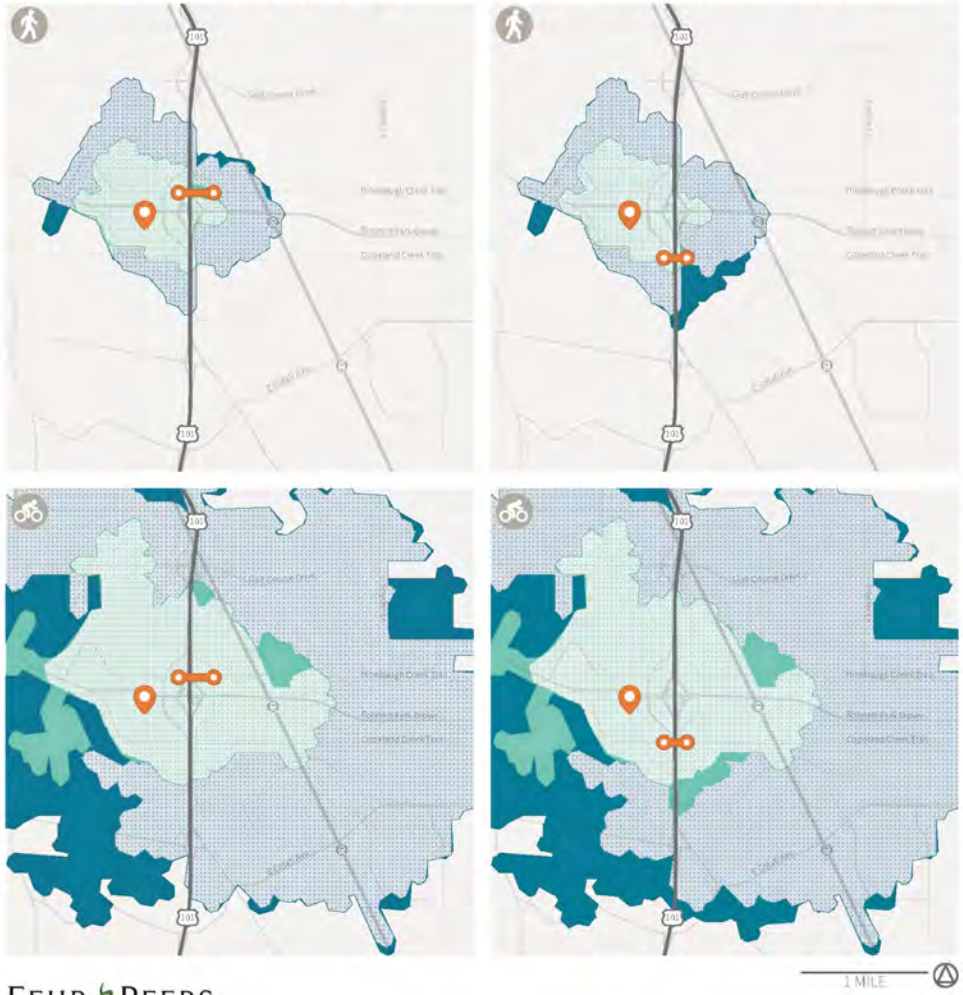
Access between the Rohnert Park Expressway (RPX) Shopping Centers and future households and jobs increases with both the Hinebaugh and Copeland Creek Alternatives compared to existing conditions. Access to future households within a 25-minute walk or 20-minute bike ride is slightly greater with the Copeland Creek Alternative. The increase in access to future jobs from the shopping centers is relatively similar between the two bridge alternatives.

Rohnert Park HIGHWAY 101 BIKE & PEDESTRIAN CROSSING

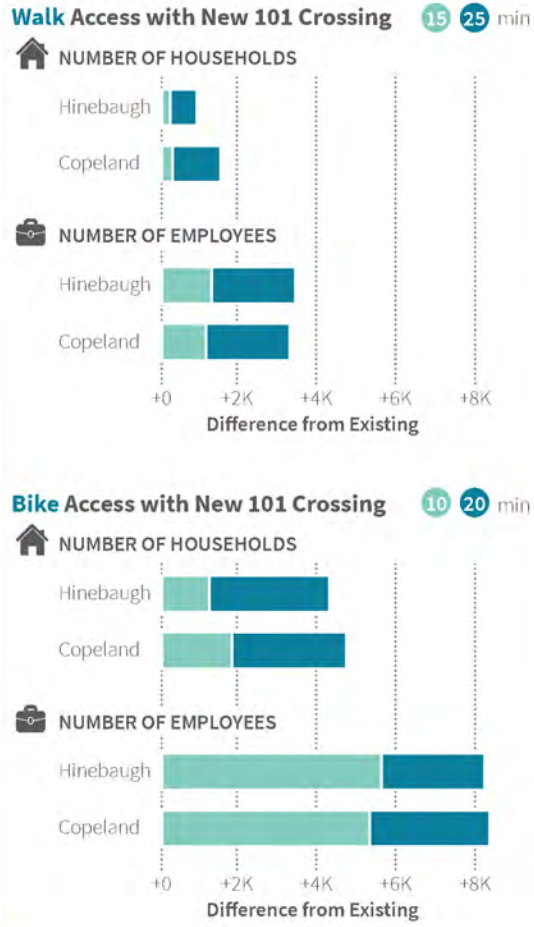
Methodology: Future access analysis assumes the household and employment growth proposed as part of the ongoing Rohnert Park General Plan Update and the bikeways proposed in SCTA's 2014 Countywide Bicycle and Pedestrian Master Plan.

Hinebaugh Creek Alternative

Copeland Creek Alternative



Future Access to RPX Shopping Centers



* Future access includes the proposed connection of Hinebaugh Creek Trail across SMART and Foxtail Golf Club, and would be reduced without this connection.
** Future access along Copeland Creek Trail would increase with enhancements to north/south connections (e.g., Redwood Drive).

FEHR PEERS

Expanded Accessibility with a New US-101 Bike & Pedestrian Crossing

How would access to the **Stadium Lands Planned Development** change with a new crossing at Hinebaugh or Copeland Creek?

Rohnert Park HIGHWAY 101 BIKE & PEDESTRIAN CROSSING

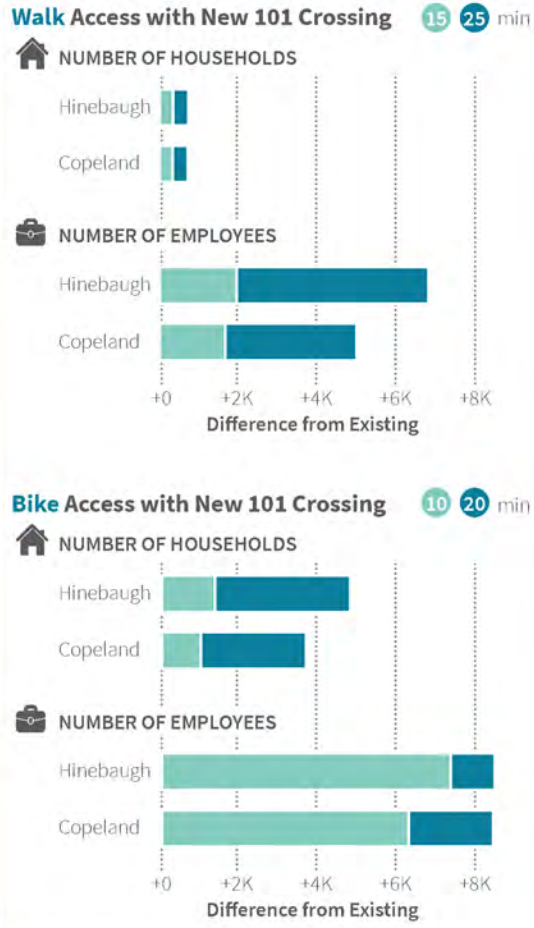
Access between the Stadium Lands Planned Development (PD) and future households and jobs increases with both the Hinebaugh and Copeland Creek Alternatives compared to existing conditions. The increase in access within a 25-minute walk or 20-minute bike ride tends to be slightly greater with the Hinebaugh Alternative, which reflects the proximity of the Hinebaugh Creek Trail to the planned development.

Methodology: Future access analysis assumes the household and employment growth proposed as part of the ongoing Rohnert Park General Plan Update and the bikeways proposed in SCTA's 2014 Countywide Bicycle and Pedestrian Master Plan.

Hinebaugh Creek Alternative

Copeland Creek Alternative

Future Access to Stadium Lands PD



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Methodology: Future access analysis assumes the household and employment growth proposed as part of the ongoing Rohnert Park General Plan Update and the bikeways proposed in SCTA's 2014 Countywide Bicycle and Pedestrian Master Plan.

Hinebaugh Creek Alternative

Copeland Creek Alternative

Walking

TRAVEL TIME (minutes)

15 25

Existing

Future with New Crossing

Biking

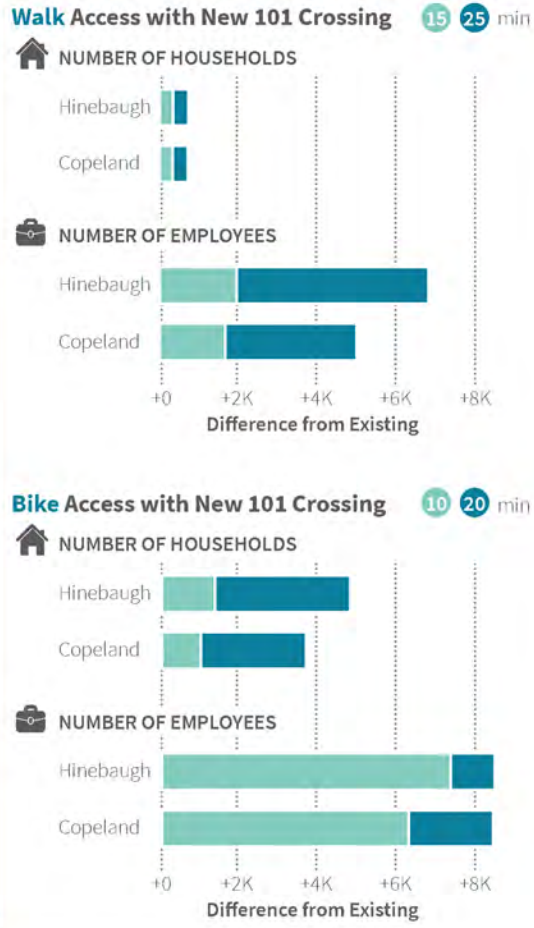
TRAVEL TIME (minutes)

10 20

Existing

Future with New Crossing

Future Access to Stadium Lands PD



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FEHR PEERS

BKF 100+ YEARS
ENGINEERS . SURVEYORS . PLANNERS Delivering Inspired Infrastructure

MEMORANDUM

Date: February 24, 2021 **BKF Job Number:** 20200181

Deliver To: Oscar Tsai, Steven Grover & Associates (SGA)

From: Ramon Alvarez-Muro, PE, BKF Engineers

Subject: **Rohnert Park - Bicycle/Pedestrian Crossing US 101 - Feasibility Study**
Copeland Creek and Hinebaugh Creek HEC-RAS Hydraulic Model

This memo presents the steps taken by the project in establishing a baseline model of the hydraulic condition for Copeland Creek and Hinebaugh Creek, specifically focused on the feasibility of an underpass bicycle/pedestrian crossing, utilizing the existing culverts beneath Highway (US) 101. All creek channels crossing Rohnert Park east to west are not part of the Sonoma County Flood Insurance Study (FIS) detailed study area within the FIS, and therefore BKF Engineers (BKF) was tasked with creating a preliminary hydraulic models for Copeland and Hinebaugh creeks.

I. CREEK MODELS

Creek geometries (channel widths, depths, side slopes) and flowline slopes were taken from As-Built plans provided to BKF by Sonoma County Water Agency (SCWA). The Federal Emergency Management Agency (FEMA) FIS dated May 15, 2020, was used to derive 100-Year Flows and manning's roughness coefficient, mimicking the coefficients of other nearby, similar creeks that have been modeled. The FIS provides Laguna de Santa Rosa flows directly upstream and downstream of the confluence with Copeland and Hinebaugh Creeks; the difference between the upstream and downstream flows, were taken to be the contribution from the corresponding creeks under study. Lastly the dimensions of the existing cross culvert double barrel and quad barrel configurations, were extracted from data provided by Steven Grover & Associates (SGA), via an AutoCAD file; these dimensions are assumed to match the Caltrans as-builts for the existing culvert structures.

All data listed above was used to create a simple HEC-RAS model for each creek, with the only culvert modeled for each creek being the existing US 101 culverts; existing upstream and downstream structures, bridges, channel deviations, and related appurtenances were not considered in this preliminary model. Figure 1 is a plan view of the river reach modeled as well as location of the cross sections location.

II. EXISTING CONDITION HYDRAULICS

As the detailed results on Table 1 demonstrate, neither the Copeland nor Hinebaugh Creek culverts are large enough to contain their respective 100-Year Flows; each creek experiences flows above their top of bank elevations. Hinebaugh Creek with a channel depth of 11-ft (to top of bank), flows at a maximum depth of 13.2-ft upstream of the existing US 101 culvert; Copeland

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Creek with a depth of 11.2-ft (to top of bank), flows at a maximum depth of 13.9' upstream of the existing US 101 culvert. Creek 100-Year HEC-RAS Flow profiles are provided on Figures 2 and 3.

Based on these preliminary findings under existing (no-build) conditions, neither of these US 101 creek culverts are well-suited for culvert modifications necessary to introduce a bicycle/pedestrian underpass concept within the existing structure.

Barring any improvements to the existing culvert/channel system to not exacerbate existing upstream creek flooding issues, further modeling/analysis of the project's build (bicycle/pedestrian underpass concept) conditions was not pursued.

III. LIST OF ATTACHMENTS

Figure 1 – HEC-RAS River Reach Alignment
Figure 2 – Copeland Creek HEC-RAS Creek Profile
Figure 3 – Hinebaugh Creek HEC-RAS Creek Profile

Table 1 – Copeland and Hinebaugh Creek - Existing 100-Year Storm Hydraulics

Sonoma County FEMA FIS No. 06097CV001F Excerpts

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FIGURE 1. HEC-RAS ALIGNMENTS

NOT TO SCALE

FIGURE 2. COPELAND CREEK PROFILE

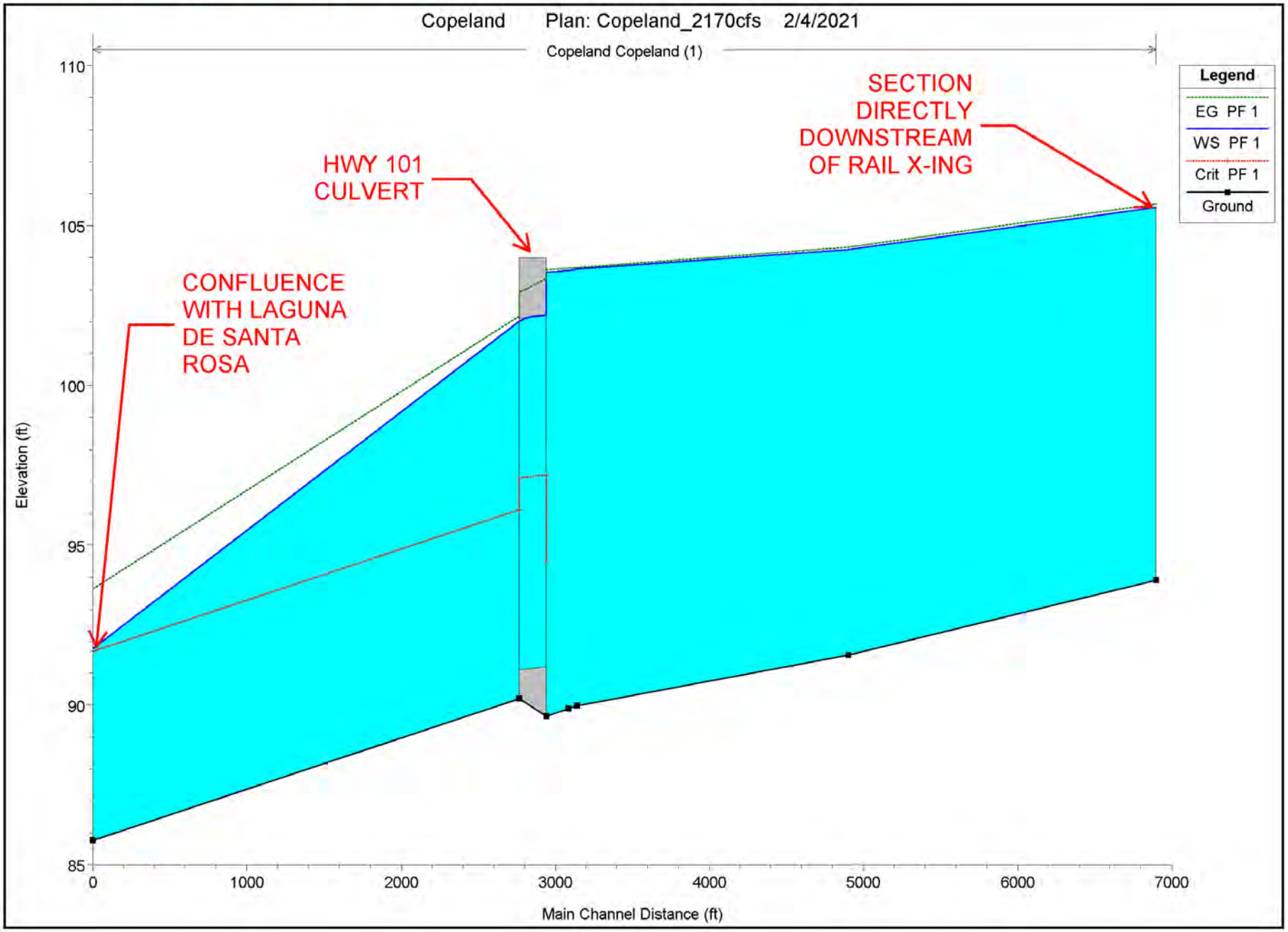
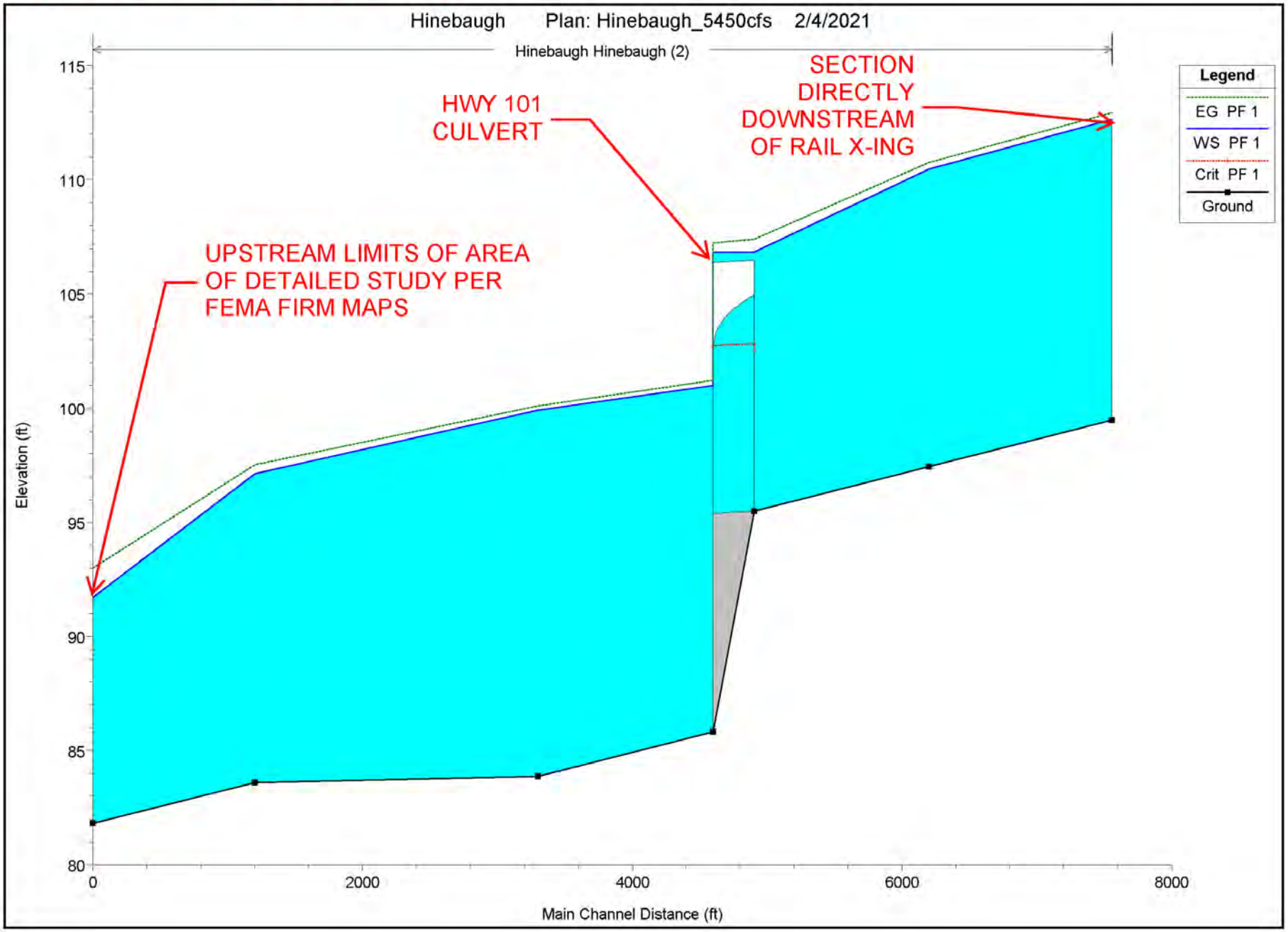


FIGURE 3. HINEBAUGH CREEK PROFILE



BKF#20200181
HEC-RAS OUTPUT
Hinebaugh Creek & Copeland Creek
Existing 100-Year Storm Event Hydraulics

River Station	Peak Flow (cfs)[6]	Minimum Channel Elev. (ft)	Flow Depth (ft)	Water Surface Elevation (ft)[1,2,4]	Top of Bank Elevation (ft)	Flood Depth (ft)[3]	Critical Water Surface (ft)	Energy Grade Elevation (ft)	Energy Grade Slope (ft/ft)	Velocity Channel (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Channel
Hinebaugh Creek													
7559	5,450	99.48	13.2	112.65	110.48	2.2	-	112.94	0.002	4.3	1267	200	0.30
6200	5,450	97.44	13.0	110.47	108.44	2.0	-	110.77	0.002	4.4	1238	200	0.31
4905	5,450	95.50	11.3	106.84	106.50	0.3	102.54	107.40	0.005	6.0	908	200	0.50
4601	Hwy Culvert												
4600	5,450	85.83	15.2	101.00	96.83	4.2	-	101.23	0.001	3.8	1428	200	0.25
3300	5,450	83.88	16.0	99.92			-	100.10	0.001	3.4	1600	200	0.21
1200	5,450	83.62	13.5	97.14	94.62	2.5	-	97.52	0.002	5.0	1096	200	0.37
0	5,450	81.82	9.9	91.73	93.82	-2.1	89.41	93.01	0.006	9.1	601	87	0.61
Copeland Creek													
6898	2,170	93.90	11.7	105.57	105.10	0.5	-	105.67	0.001	2.6	826	200	0.23
4900	2,170	91.56	12.7	104.26	102.76	1.5	-	104.33	0.000	2.1	1032	200	0.16
3141	2,170	89.98	13.7	103.64	101.18	2.5	-	103.69	0.000	1.8	1225	200	0.13
3086	2,170	89.89	13.7	103.60	101.09	2.5	-	103.67	0.001	2.2	1005	200	0.17
2943	2,170	89.66	13.9	103.54	100.86	2.7	94.47	103.61	0.000	2.1	1051	166	0.14
2767	Hwy Culvert												
2767	2,170	90.20	11.8	102.01	101.40	0.6	96.12	102.18	0.001	3.3	666	134	0.26
0	2,170	85.77	6.0	91.77	95.77	-4.0	91.69	93.64	0.019	11.0	198	51	0.98

Notes:
1. Hinebaugh Creek tailwater elevation 91.73 per FEMA FIRM Map.
2. Copeland Creek tailwater set to elevation 91.77 per FEMA FIRM Map.
3. Positive value indicates flow is above channel's top of bank elevation.
4. Manning's n value set to 0.045 mimicking Laguna De Santa Rosa per FEMA FIS.
5. Channel slope and geometry modeled per as-builts
6. Peak flows per FEMA FIS 06097CV001F Dated May 15, 2020.

FLOOD INSURANCE STUDY

VOLUME 1 OF 5

SONOMA COUNTY, CALIFORNIA
AND INCORPORATED AREAS

Community Name	Community Number
CLOVERDALE, CITY OF	[illegible]
COTATI, CITY OF	[illegible]
HEALDSBURG, CITY OF	[illegible]
PETALUMA, CITY OF	[illegible]
ROHNERT PARK, CITY OF	[illegible]
SANTA ROSA, CITY OF	[illegible]
SEBASTOPOL, CITY OF	[illegible]
SONOMA, CITY OF	[illegible]
SONOMA COUNTY (UNINCORPORATED AREAS)	[illegible]
WINDSOR, TOWN OF	[illegible]

Preliminary Date: May 15, 2020

REVISED: < DateTBD >

Federal Emergency Management Agency
FLOOD INSURANCE STUDY NUMBER
06097CV001F

Table 4. Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square miles)	Peak Discharges (Cubic Feet per Second)			
		10-percent	2-percent	1-percent	0.2-percent
KELLY CREEK					
Above Thompson Creek	0.90	210	325	380	520
KIZER CREEK					
Upstream of confluence with Petaluma Creek	1.33	322	420	462	555
At Middle Two Rock Road	0.46	170	220	245	290
LAGUNA DE SANTA ROSA					
Upstream of confluence with Mark West Creek	170.0	21,100	30,300	35,100	44,900
Downstream of confluence of Santa Rosa Flood Control Channel	166.0	16,800	23,900	28,000	35,700
Upstream of confluence of Santa Rosa Flood Control Channel	87.4	14,000	20,100	23,300	30,800
Upstream of confluence of Irwin Creek	*	13,200	19,100	22,000	29,200
Upstream of confluence of Gravenstein Creek	*	12,300	18,000	20,500	27,200
Upstream of confluence of Pleasant Hill Creek	*	11,600	16,900	19,300	25,600
Upstream of confluence of Roseland Creek	*	10,800	15,800	18,000	23,900
Upstream of confluence of Blucher Creek	*	9,570	14,000	15,950	21,200
Upstream of confluence of Colgan Creek	*	7,710	11,200	12,850	17,100
At Stony Point Road	*	7,170	10,400	11,950	15,900
Downstream of confluence of Hinebaugh Creek	*	5,550	7,900	9,250	12,000
Upstream of confluence of Hinebaugh Creek	*	2,280	3,250	3,800	5,000
Upstream of confluence with Copeland Creek	*	977	1,410	1,630	2,120
At U.S. Highway 101	3.8	720	1,250	1,500	2,100
Upstream of confluence of Cotati Creek	1.6	320	540	660	930

*Data Not Available

HINEBAUGH = 9,250 - 3,800 = 5,450 cfs
COPELAND = 3,800 - 1,630 = 2,170 cfs

Table 11. Manning's "n" Values (continued)

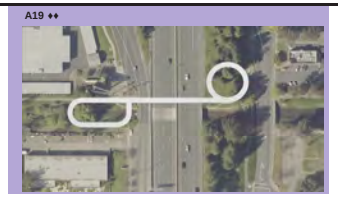
Flooding Source	Main Channel	Overbank Area	Bridge and Culvert Structures
East Austin Creek	0.040	0.080	*
East Washington Creek	0.020 – 0.040	0.020 – 0.100	*
East Windsor Creek	0.024 – 0.070	0.035 – 0.040	0.019 – 0.045
Fife Creek	0.060	0.100	*
Fulton Creek	0.020 – 0.070	0.035 – 0.045	0.014 – 0.025
Gibson Creek	0.035 – 0.070	0.045	0.020 – 0.050
Hulbert Creek	0.040 – 0.090	0.100	0.014
Hulbert Creek Tributary	0.055	0.100	0.014
Hunter Creek	0.035	0.040 – 0.060	*
Hunter Lane Channel	0.035	0.040 – 0.060	*
Kelly Creek	0.020 – 0.070	0.050	*
Kizer Creek	0.045 – 0.100	0.050 – 0.090	0.020 – 0.025
Laguna de Santa Rose	0.035 – 0.055	0.035 – 0.070	0.020 – 0.080
Lakeville Street to Section Q	0.015	0.050	*
Liberty Creek	0.035 – 0.050	0.050 – 0.070	0.020 – 0.030
Lichau Creek	0.035 – 0.065	0.035 – 0.095	0.020 – 0.055
Lynch Creek	0.030 – 0.100	0.030 – 0.100	*
Mark West Creek	0.035 – 0.070	0.035 – 0.120	0.018 – 0.050
Marin Creek	0.035 – 0.070	0.050 – 0.060	0.017 – 0.030
McBrown Creek	0.040 – 0.100	0.050 – 0.100	0.020 – 0.025
Moorland Creek	0.040	0.045	*
Mount Hood Creek	0.030 – 0.040	0.050 – 0.050	0.014
Nathanson Creek	0.025 – 0.050	0.040 – 0.100	0.020 – 0.040
Naval Creek	0.035 – 0.050	0.020 – 0.040	0.015 – 0.024
North Kenwood Creek	0.040 – 0.050	0.050 – 0.100	0.020 – 0.030
Petaluma River	0.025 – 0.055	0.025 – 0.070	*
Pocket Canyon	0.040 – 0.090	0.070 – 0.120	0.014
Pool Creek	0.017 – 0.100	0.030 – 0.075	0.020 – 0.060
Redwood Creek	0.014 – 0.085	0.035 – 0.065	0.014 – 0.050

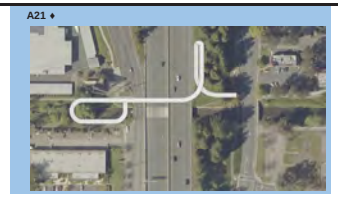
ROHNERT PARK HIGHWAY 101 BICYCLE AND PEDESTRIAN CROSSING: COPELAND CREEK ALIGNMENT MATRIX

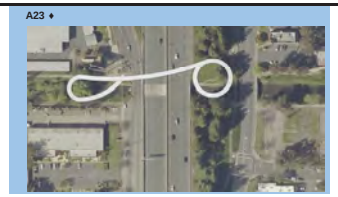
Alignment Alternative

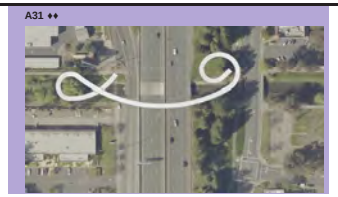
Plan View

Color Code
- ♦ In top ten
- ♦♦ In top six (discussed in Study)
- ♦♦♦ Top two (recommended alignments)

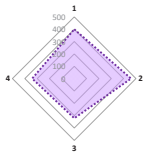


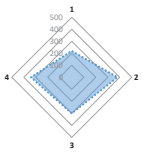


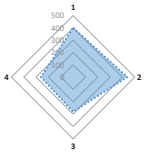


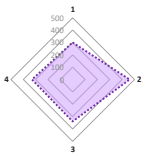


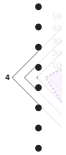
		A19 ♦♦		A21 ♦		A23 ♦		A31 ♦♦		A33 ♦♦	
A	Total length	1,050	LF	1,040	LF	1,026	LF	1,009	LF	1,020	LF
B	Total width (out-to-out)	14	LF	14	LF	14	LF	14	LF	14	LF
C	Deck Depth	36	IN	24	IN	24	IN	24	IN	36	IN
D	West approach length	440	LF	430	LF	409	LF	390	LF	440	LF
E	West approach slope	5	%	5	%	5	%	5	%	5	%
F	East approach length	440	LF	430	LF	442	LF	397	LF	420	LF
G	East approach slope	5	%	5	%	5	%	5	%	5	%
H	Main span length	170	LF	180	LF	175	LF	222	LF	150	LF
I	Deck area	14,700	SQFT	14,560	SQFT	14,364	SQFT	14,126	SQFT	14,280	SQFT











No.	Criteria	Weight	Score (0-5)	Weighted Score	Notes	Score (0-5)	Weighted Score	Notes	Score (0-5)	Weighted Score	Notes	Score (0-5)	Weighted Score	Notes	Score (0-5)	Weighted Score	Notes
1	**Safety & Experience**																
1.1	Geometrics (Slopes, Sightlines, & Grades Ide	40	5	200	West side corner reduces visibility	3	120	Tight east side switchback; reduced visibility	4	160	Smooth curves	3	120	Tighter turns may reduce visibility	1	40	Long approaches
1.2	Adequate Mixing Space	20	4	80	Potential for east side TD plaza	2	40	Abrupt terminations at trail and street	3	60	Potential for east side TD plaza	2	40	Potential for east side TD plaza	1	20	Constrained TDs
1.3	Landmark Potential	20	2	40	East side helix provides design opportunities	2	40	Concrete girder limits design choices	5	100	Clear span structure provides design choices	4	80	Unique curve over fwy	2	40	Concrete girder li
1.4	Elegance	20	4	80	Concrete girder limits design choices	1	20	Switchback structure has large visual mass	4	80	Curves provide design opportunities	3	60	Curves provide design opportunities	1	20	Switchback struc
	Subtotal	**100**	**15**	**400**		**8**	**220**		**16**	**400**		**12**	**300**		**5**	**120**	
2	**Connectivity**																
2.1	Wayfinding	20	5	100	TDs easily visible on bike/ped network	5	100	TDs easily visible	4	80	TDs visible; east side TD farthest north	5	100	TDs easily visible	3	60	West side TD loc
2.2	Length	40	4	160	Moderate	2	80	Long	4	160	Moderate	4	160	Short	2	80	May feel longer d
2.3	Multiple Routes Served	40	5	200	TDs support multi-directional travel	5	200	TDs support multi-directional travel	5	200	TDs support multi-directional travel	5	200	TDs support multi-directional travel	4	160	TDs support mult
	Subtotal	**100**	**14**	**460**		**12**	**380**		**13**	**440**		**14**	**460**		**9**	**300**	
3	**Impacts**																
3.1	Trees	20	3	60	Several small trees to be replaced	3	60	Several small trees to be replaced	2	40	Several trees to be replaced	4	80	Several small trees to be replaced	4	80	Few small trees t
3.2	Creek	10	3	30	Construction over creek x1	3	30	Construction over creek x2	1	10	Significant construction over creek x4	1	10	Significant construction over creek x4	5	50	Minimal
3.3	Culvert(s)	10	3	30	Fwy bent close to culvert	3	30	Fwy bent close to culvert	5	50	None	5	50	None	5	50	None
3.4	Right-of-Way	20	2	40	State ROW on east side, Cotati on SW side	3	60	State ROW on east side, Cotati on SW side	3	60	State ROW on east side, Cotati on SW side	3	60	State ROW on east side, Cotati on SW side	5	100	State ROW on ea
3.5	Adjacencies	10	5	50	East approach in fwy recovery zone	2	20	East approach in fwy recovery zone	3	30	East approach in fwy recovery zone	3	30	No impact	1	10	Requires full use
3.6	Utilities	10	4	40	West side bent impacts UG utilities	4	40	Minimal	2	20	West side impacts UG utilities	4	40	Minimal	0	0	West side impact
3.7	Maintenance Paths	10	3	30	West TD reduces access to creek	3	30	West side approach above maintance path	2	20	West side approach reduces creek access	2	20	West side approach reduces creek access	5	50	Remain clear
3.8	Views	10	4	40	No impact	3	30	Large visual mass of structure along hwy	5	50	No impact	5	50	No impact	1	10	Large west side
	Subtotal	**100**	**27**	**320**		**24**	**300**		**23**	**280**		**27**	**340**		**26**	**350**	
4	**Feasibility**																
4.1	Cost	40	4	160	Concrete structure	4	160	Concrete structure	2	80	Steel main span cost may be higher v. concrete	3	120	Steel main span cost may be higher v. concrete	2	80	Concrete structure
4.2	Constructability & Approvals	30	3	90	Construction impacts to hwy operations	3	90	Design exceptions; construction impacts hwy	2	60	Design exceptions; large cantilever over creek	4	120	Design exception needed for tighter radii	2	60	Design exception
4.3	Structural Options and Efficiency	30	3	90	Bent needed in hwy median	3	90	Bent needed in hwy median	4	120	Self-contained tied arch main span possible	3	90	Tied arch possible; inconsistent deck cross section	3	90	Bent needed in h
	Subtotal	**100**	**10**	**340**		**10**	**340**		**8**	**260**		**10**	**330**		**7**	**230**	
	Total	**2000**	66	**1520**	76%	54	**1240**	62%	60	**1380**	69%	63	**1430**	72%	47	**1000**	50%

Additional Comments

- CIP box girder structure
- 3-ft structure depth with a conventional concrete box girder structure has a depth-to-span ratio of 4%, resulting in 75-ft max span

- CIP box girder structure
- East approach adjacent to fwy - noisy; tall fencing required

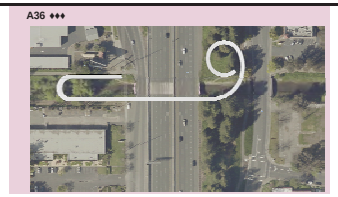
- Steel main span
- Circular east approach less compatible with setting compared to other alternatives

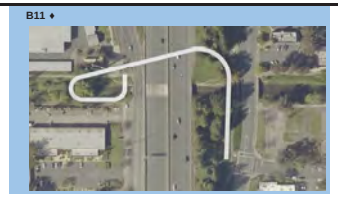
- Steel main span
- Utilizes existing gap in trees on east side
- Deck cross section must vary due to reversal of plan alignment curvature reversal on the west side

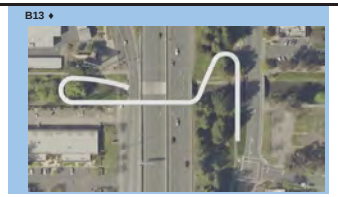
- Discuss in Study due to utilizatio
property with pump house and bi
- CIP box girder structure
- Does not cross over creek on eit
- 3-ft structure depth with a conve
structure has a depth-to-span rati
span

MATCH LINE

MATCH LINE







				1,037	LF			1,031	LF			1,025	LF			959	LF			1,201	LF		
				14	LF			14	LF			14	LF			14	LF			14	LF		
				24	IN			36	IN			24	IN			24	IN			36	IN		
				411	LF			434	LF			375	LF			394	LF			430	LF		
				5	%			5	%			5	%			5	%			5	%		
				436	LF			407	LF			440	LF			369	LF			400	LF		
				5	%			7	%			5	%			7	%			5	%		
				190	LF			190	LF			210	LF			196	LF			371	LF		
				14,518	SQFT			14,434	SQFT			14,350	SQFT			13,426	SQFT			16,814	SQFT		
Notes	Score (0-5)	Weighted Score	Notes	Score (0-5)	Weighted Score	Notes	Score (0-5)	Weighted Score	Notes	Score (0-5)	Weighted Score	Notes	Score (0-5)	Weighted Score	Notes	Score (0-5)	Weighted Score	Notes	Score (0-5)	Weighted Score	Notes
s with tight turns; poor visibility	5	200	Straight paths, smooth curves; slopes <5%	2	80	West side corner reduces visbility; east approach >5%	2	80	Slight east side corner reduces visibility	4	160	East side approach >5%	5	200	Straight path, but corners reduce visibility
s at trail and street	5	100	Potential for east side TD plaza	5	100	Potential for east side TD plaza	4	80	Constrained west TD; potential east TD plaza	5	100	Potential for east side TD plaza	1	20	Constrained east side TD
mits design choices	5	100	Clear span structure provides design choices	2	40	Concrete girder limits design choices	2	40	Concrete girder limits design choices	5	100	Curve over freeway and tree path is unique	2	40	Concrete girder limits design opportunities
ures have large visual mass	5	100	Smooth curves provide design opportunities	1	20	Utilitarian	2	40	Utilitarian	5	100	Smooth curves	1	20	Long crossing has large visual mass
	20	**500**		**10**	**240**		**10**	**240**		**19**	**460**		**9**	**280**	
tion not easily visible	5	100	TDs easily visible on bike/ped network	3	60	East side entrance less visible from Copeland	3	60	East side entrance less visible from Copeland	3	60	East side entrance less visible from Copeland	5	100	TDs easily visible
e to switchbacks	4	160	Moderate	2	80	Skewed crossing may feel longer	3	120	East side backtracking may feel longer	5	200	Short	1	40	Very long
ulti-directional travel	5	200	TDs support multi-directional travel	3	120	East side TD far from Copeland Creek Trail	3	120	East side TD far from Copeland Creek Trail	3	120	East side TD far from Copeland Creek Trail	5	200	TDs support multi-directional travel
	14	**460**		**8**	**260**		**9**	**300**		**11**	**380**		**11**	**340**	
ees to be replaced	3	60	Several small trees to be replaced	4	80	Few small trees to be replaced	3	60	Several small trees to be replaced	3	60	Several small trees to be replaced	4	80	Few small trees to be replaced
	4	40	Construction over creek x2	3	30	Construction over creek x3	2	20	Significant construction around creek x3	3	30	Construction around creek x3	2	20	Significant construction over creek x4
	5	50	None	5	50	None	2	20	West side TD and bents close to culvert	5	50	None	3	30	Fwy bent close to culvert
on west side	5	100	State ROW on east side, Cotati on SW side	2	40	State ROW on east side, Cotati on SW side	4	80	State ROW on east side, Cotati on SW side	4	80	State ROW on east side	1	20	State east side; Cotati SW side; private east TD
l use of city property on west side	5	50	East approach in fwy recovery zone	3	30	East side approach across from residences	3	30	East side approach across from residences	5	50	East approach within trees, away from street	2	20	East side approach next to residences
npacts UG utilities and pump house	5	50	Minimal	1	10	Impacts to pump station and billboard	4	40	Minimal	5	50	Minimal	1	10	HV lines on Commerce to be relocated
ur	3	30	Retaining wall on west side adjacent to path	3	30	West approach reduces access to creek	3	30	West side approach above path	4	40	West side approach above path	1	10	Approaches cross maintenance paths
side switchback structure	5	50	No impact	2	20	Large visual mass of structure along Commerce	2	20	Large visual mass of structure along Commerce	5	50	Adjacency screened by trees	1	10	Reduced views from homes and Commerce
	35	**430**		**23**	**290**		**23**	**300**		**34**	**410**		**15**	**200**	
ucture; pump house relocation	4	160	Steel main span cost may be higher v. concrete	4	160	Concrete structure	3	120	Concrete structure	4	160	Ongoing maintenence on east side for leaves	1	40	Long structure; foundations; utility relocations
ptions; construction impacts hwy	4	120	Design exception needed for tighter radii	3	90	Construction impacts to hwy operations	3	90	Construction impacts to hwy operations	3	90	Tree protection required during construction	2	60	Construction over all roads
f in hwy median	5	150	Straight clear span provides design options	3	90	Bent needed in hwy median	3	90	Bent needed in hwy median	5	150	Self-contained tied arch main span possible	2	60	Bent needed in hwy median
	13	**430**		**10**	**340**		**9**	**300**		**12**	**400**		**5**	**160**	
	82	**1820**	91%	51	**1130**	57%	51	**1140**	57%	76	**1650**	83%	40	**980**	49%
ization of City-owned west side nd flyboard on either side conventional concrete box girder n range of 4%, resulting in 75-ft max	• Steel main span • Straight alignment over fwy allows for use of concrete structure for slight cost savings in structure, but length and impacts would increrease			• CIP box girder structure • East approach structure adjacent to north-south class I path separates the street from the trees			• CIP box girder structure • East approach structure adjacent to north-south class I path separates the street from the trees • North-south Class I path along Commerce would need to be rereouted - crossing of structure and path results in 11-ft of vertical clearance			• Steel main span • Radius of curvature for main span constrained by min 10-ft horizontal clearance between aerial structure and existing utility pole - 33-ft min radius on both east and west sides			• Discuss in Study due to touchdown location on east side of Commerce • CIP box girder structure • Large visual mass over Commerce • Many supports and foundations required		

January 28, 2021

Mr. Steven Grover, Architect, PE
Steven Grover & Associates
800 Heinz Avenue, Studio 11
Berkeley, CA 94710

Pedestrian Crossing Evaluation for Commerce Boulevard at Copeland Creek

Dear Mr. Grover;

As requested, W-Trans has prepared an evaluation of a potential pedestrian crossing of Commerce Boulevard on the north side of Copeland Creek in the City of Rohnert Park. The purpose of this assessment is to assist the City of Rohnert Park and *Highway 101 Bike and Pedestrian Crossings Feasibility Study* consultant team led by Steven Grover & Associates (SGA) in selecting a preferred alignment and landing locations for a potential bicycle and pedestrian overpass near the Copeland Creek corridor. Specifically, the assessment was completed to determine what type of pedestrian crossing treatment would be warranted and how it would affect traffic on the corridor given its midblock location.

Recommendations for the appropriate crossing treatment were based on information provided in the *Transportation Cooperative Research Program Report 112/ National Cooperative Highway Research Program Report 562* (TCRPR 112/NCHRPR 562), which identifies thresholds for pedestrian and vehicle volumes, speeds, and compliance indicating potential need for various traffic control devices. Additionally, the option for a pedestrian hybrid beacon, also known as a High-intensity Activated crossWalK (HAWK), was considered using guidelines from the *California Manual on Uniform Traffic Control Devices* (CA-MUTCD), Chapter 4F. Due to impacts to travel patterns resulting from the COVID-19 pandemic, qualitative guidance was incorporated from the *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations*, Federal Highway Administration, January 2018 (FHWA *Guide*). This report summarizes pedestrian crossing warrant findings, the results of a queuing analysis, guardrail assessment, conclusions, and recommendations.

Existing Conditions

Commerce Boulevard is an arterial street in the City of Rohnert Park that has one lane in each direction with a center turn lane and a northbound bicycle lane at the overcrossing of Copeland Creek. The posted speed limit is 35 miles per hour (mph). There is a sidewalk on the east side and a multi-use path on the west side. North of the creek the roadway widens to two lanes in each direction with a center turn lane. At the creek the road is approximately 43 feet wide.

Placement of Crossing

The potential new crossing would be located on a segment of Commerce Boulevard where pedestrians and bicyclists are already observed crossing the street; these users appear to be crossing between the western terminus of the Copeland Creek trails and the multiuse pathway that runs along the west side of Commerce Boulevard. With a potential bicycle and pedestrian overcrossing of US 101 landing near this area, bicycle and pedestrian crossing demand would increase. It appears that relatively few users traveling between the Commerce Boulevard and Copeland Creek paths divert the approximately 400-foot (round trip) distance to cross at the Commerce Boulevard/Avram Avenue traffic signal.

There are pathways along both sides of Copeland Creek; if a new crossing is established on Commerce Boulevard, it should align with the northern Copeland Creek path to maximize the separation from the signal at Avram

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Avenue. Over time as the Priority Development Area PDA Plan area redevelops, the northern path is likely to encounter higher pedestrian and bicyclist volumes than the southern path.

Finding – If a new at-grade bicycle and pedestrian crossing is established on Commerce Boulevard at Copeland Creek, it should align with the northern creek path to maximize separation from the Avram Avenue signal and optimize convenience for the greatest number of potential users.

Applied Traffic Volumes and Analysis Scenario

Based on peak hour traffic counts obtained in 2016 at the intersection of Commerce Boulevard/Avram Avenue, traffic volumes on Commerce Boulevard are approximately 60 percent higher during the p.m. peak hour than the a.m. peak hour. Accordingly, operation during the p.m. peak hour was chosen for the analysis. The 2016 volumes were translated to year 2040 future volumes by adding traffic associated with the Avram House apartment project currently under construction, and then balancing volumes on Commerce Boulevard to be consistent with the future volumes applied in the Rohnert Park PDA Plan EIR traffic analysis. Based on these projections, Commerce Boulevard near the Copeland Creek bridge is anticipated to have an average daily traffic volume of approximately 18,000 vehicles per day in 2040, including 1,760 vehicles during the p.m. peak hour.

Pedestrian Crossing Warrant Findings

The TCRPR 112/NCHRPR 562 includes information for assessing the most appropriate pedestrian crossing treatments based on a chart of major road vehicle volumes plotted against pedestrian volumes crossing the major street. Depending on the volume of vehicles and pedestrians, the report recommends an increasing intensity of treatment, progressing from crosswalks to rectangular rapid flashing beacons (RRFBs), HAWKs, and finally traffic signals. The report mentions the possibility of installing passive treatments at locations with fewer than 20 pedestrians per hour, such as curb extensions, median refuges, enhanced signing and markings, and other traffic calming devices.

As pedestrian data is not available for this location, a sensitivity analysis was conducted to determine the pedestrian volume that would be required to recommend an RRFB, a HAWK, and a signal. With one pedestrian crossing per hour, an RRFB would be recommended via this methodology. A HAWK would be recommended with four pedestrians per hour, and a signal with 133 pedestrians per hour. Based on this sensitivity analysis, a HAWK appears to be the most appropriate crossing treatment for this location as the pedestrian volume would most likely be less than 100 pedestrians per hour, but greater than three.

Chapter 4F of the CA-MUTCD also provides guidance for the installation of HAWKs based on a chart of major street vehicle volumes plotted against pedestrian volumes crossing the major street, similar to the TCRPR 112/NCHRPR 562 chart. However, the CA-MUTCD chart includes different minimum threshold lines based on the curb-to-curb width that the crossing treatment would occupy, with shorter lengths requiring higher volumes to merit the same treatment. The CA-MUTCD requires a minimum of 20 pedestrians crossing the major street per hour to meet the warrant. Assuming that there would be at least 20 pedestrians in one hour, a HAWK would be warranted for Commerce Boulevard at Copeland Creek, further supporting the premise that a HAWK is the appropriate treatment for this location.

The FHWA *Guide* provides recommendations to address safety concerns with uncontrolled pedestrian crossing locations, such as a crosswalk across the major street at a location with stop controls only on the minor street. This resource prescribes a matrix with roadway configuration (number of lanes and presence of a median) categorized by vehicle volumes and posted speed limits. The FHWA *Guide* chart indicates that for a three-lane roadway without a raised median, with a speed limit of 35 mph, and an ADT of 18,000 vehicles, high-visibility crosswalk markings should always be considered in addition to advance yield/stop markings and "stop here for/yield here to pedestrian" signs, as well as treatments such as HAWKs. Other candidate treatments as part of this

methodology include curb extensions and a pedestrian refuge island. As there is no shoulder, curb extensions would not be appropriate for this location. However, a pedestrian refuge island would increase pedestrian safety while crossing Commerce Boulevard, providing space for pedestrians between traffic lanes, slowing traffic approaching the crossing, and preventing southbound drivers from traveling through the crossing in the center turn lane to make a left-turn south of the crossing at Avram Avenue. A raised median island at this location would cause no conflicts or changes to circulation associated with nearby driveways.

Copies of worksheets for the TCRPR 112/NCHRPR 562, CA-MUTCD Chapter 4F, and FHWA *Guide* methodologies are enclosed.

Finding – Based on application of the materials used in the various manuals and guides, a HAWK system would be warranted with 20 crossing pedestrians in one hour. An RRFB or signal may be warranted at lower or higher pedestrian volumes, respectively. The FHWA *Guide* methodology also indicates that a pedestrian refuge island is a candidate treatment for this location.

Recommendation – If the future US 101 bicycle overcrossing is chosen to align with the Copeland Creek Trail, a new pedestrian crossing controlled by a HAWK should be installed on Commerce Boulevard at the northern creek pathway. To provide additional pedestrian protection while crossing Commerce Boulevard, installation of a pedestrian refuge island in the median turn lane is recommended, as well as advance stop lines and signage. A high-visibility crosswalk design is recommended.

Queue Analysis

To determine the potential impacts of installing a HAWK at the proposed crossing location, a queue analysis was performed using the SimTraffic software package. This assessment was completed to confirm that southbound queues occurring at the Commerce Boulevard/Avram Avenue signal would not extend to the new HAWK crossing, and that vehicle queues generated by the HAWK would not extend into the adjacent signalized intersections at Avram Avenue/Enterprise Drive. Given the approximately 225-foot distance between the potential HAWK crossing and the nearby signal at Commerce Boulevard/Avram Avenue, the two signals should be coordinated to maintain optimal operation on the corridor. In such a coordinated timing scheme, impacts to traffic flow on northbound and southbound Commerce Boulevard could be minimized by having pedestrians and bicyclists cross at the HAWK signal at the same (or nearly the same) time as the signal at Avram Avenue serves its westbound phase. Assuming coordination of the potential HAWK crossing with the Avram Avenue signal and 20 activations during the p.m. peak hour, queue lengths were determined as summarized in Table 1.

Table 1 – Maximum Queues and Available Storage

Study Intersection *Lane*	**Available Storage**	**Maximum Queues PM Peak Hour**
1. Commerce Blvd/Copeland Creek Trail		
Northbound Through Lane	225[1]	187
Southbound Through Lane	530[2]	244
2. Commerce Blvd/Avram Ave		
Southbound Left-Turn Lane	225[1]	116
Southbound Through Lane	225[1]	174

Notes: Maximum Queue based on the average of the maximum value from five SimTraffic runs; all distances are measured in feet; [1] approximate distance between Commerce Boulevard/Avram Avenue and potential trail crossing; [2] approximate distance between the potential trail crossing and the upstream signal at Commerce Boulevard/Enterprise Drive

Finding – Installation of a HAWK or signal at the potential Copeland Creek trail crossing is not expected to result in queue spillback to either the Commerce Boulevard/Avram Avenue or Commerce Boulevard/Enterprise Drive signals under future conditions.

Recommendation – If a HAWK is installed on Commerce Boulevard at the Copeland Creek trail crossing, it should be interconnected and coordinated with the nearby signal at Commerce Boulevard/Avram Avenue to minimize operational and queuing impacts to vehicular traffic on Commerce Boulevard.

Guardrail Assessment

There is an existing guardrail on the west side of Commerce Boulevard that extends approximately 150 feet from the bridge across Copeland Creek to the north. The guardrail would prevent pedestrian access between the multi-use trail on the west side of Commerce Boulevard and the potential pedestrian crossing at the northern Copeland Creek trail. For this reason, a gap would need to be created in the guardrail to enable access. To accommodate the gap, the guardrail would need to be modified to provide an appropriate end treatment upstream of the gap, such as a concrete railing. Downstream of the gap, a concrete railing angled away from traffic would decrease the potential for damage to both the vehicle as well as the bridge structure caused if a driver collided with the bridge railing.

Recommendation – If a new crossing is established on Commerce Boulevard at the Copeland Creek trail crossing, the existing guardrail on the west side of Commerce Boulevard to the north of the bridge should be modified to create a space for pedestrians and bicyclists using the potential crossing. Concrete guardrail should be used on each side of the new gap created for the crossing, including appropriate end treatments upstream and downstream of the gap.

Conclusions and Recommendations

- Any plans to establish an at-grade bicycle and pedestrian crossing on Commerce Boulevard at Copeland Creek should align the crossing with the northern creek path to maximize separation from the Avram Avenue signal and optimize convenience for the greatest number of potential users.

- The TCRPR 112/NCHRPR 562, CA-MUTCD Chapter 4F, and FHWA *Guide* methodologies were used to assess the appropriateness of a variety of pedestrian crossing treatments for this location. It was determined that with 20 pedestrians crossing in one hour, a HAWK would be warranted.

- It is recommended that a HAWK system be installed in conjunction with the potential Copeland Creek crossing and that this HAWK system be interconnected and coordinated with the signal at Commerce Boulevard/Avram Avenue. It is further recommended that a median pedestrian refuge island be installed to provide additional protection to users of the crossing, in addition to advance stop lines and signage, and a high-visibility design for the crosswalk.

- A queue analysis was conducted to determine if installation of a HAWK or traffic signal at the potential crossing would conflict with existing traffic patterns. It was determined that the vehicle queues generated as a result of the implementation of a HAWK would not extend to the nearby signalized intersections of Commerce Boulevard/Avram Avenue or Commerce Boulevard/Enterprise Drive.

- With implementation of a new crossing on Commerce Boulevard, the guardrail on the west side of Commerce Boulevard to the north of the bridge over Copeland Creek would need to be modified to include a gap for crossing bicyclists and pedestrians. Concrete guardrail should be used on each side of the new gap, including appropriate end treatments upstream and downstream of the gap.

Thank you for giving W-Trans the opportunity to provide these services. Please call if you have any questions.

Sincerely,

Kevin Carstens, PE, TE
Associate Engineer

Zack Matley, AICP
Principal

ZM/krc/RPA081.L1

Enclosures: TCRPR 112/NCHRPR 562 Worksheets
HAWK Signal Warrant Worksheet
FHWA *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* Worksheet
SimTraffic Queue Calculations

Queuing and Blocking Report

01/14/2021

Intersection: 1: Commerce Boulevard & Avram Avenue

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	72	89	332	135	212
Average Queue (ft)	24	45	129	69	74
95th Queue (ft)	56	78	271	116	174
Link Distance (ft)	500		564		225
Upstream Blk Time (%)					0
Queuing Penalty (veh)					2
Storage Bay Dist (ft)		70		165	
Storage Blk Time (%)	0	3			1
Queuing Penalty (veh)	1	1			1

Intersection: 2: Commerce Boulevard

Movement	NB	SB
Directions Served	T	T
Maximum Queue (ft)	232	305
Average Queue (ft)	67	94
95th Queue (ft)	187	244
Link Distance (ft)	225	625
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	4	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 8

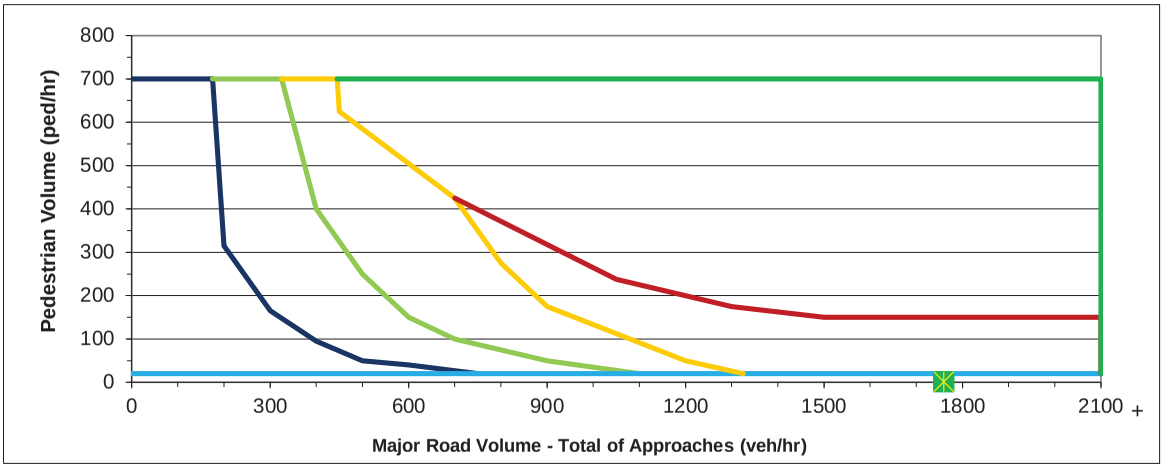
TCRP Report 112 - NCHRP Report 562 - Pedestrian Crossing Treatment Worksheet
Worksheet 1: Peak-Hour, 35 MPH or Less

Analyst and Site Information			
Analyst:	KRC	Major Street:	Commerce Boulevard
Analysis Date:	1/11/2020	Minor Street or Location:	Copeland Creek Trail Xing (Prpsd)
Data Collection Date:	Adjusted 2020 Volumes	Peak Hour:	PM

Step 1: Select worksheet (speed reflects posted or statutory speed limit or 85th percentile speed on the major street):		
a) Worksheet 1 - 35 mph or less		
b) Worksheet 2- exceeds 35 mph, communities with less than 10,000, or where major transit stop exists		
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a TCD type of treatment?		
Peak-hour pedestrian volume (ped/h), vp	2a	1
If 2a ≥ 20 ped/h, then go to Step 3.		
If 2a < 20 ped/h, then consider median refuge islands, curb extensions, traffic calming, etc. as feasible.		
Step 3: Does the crossing meet the pedestrian volume warrant for a traffic signal?		
Major road volume, total of both approaches during peak hour (veh/h), V maj-s	3a	1760
Minimum signal warrant volume for peak hour (use 3a for Vmaj-s), SC SC = 0.00021 Vmaj-s² - 0.74072 Vmaj-s + 734.125)/0.75 OR [(0.00021 3a² - 0.74072 3a + 734.125)/0.75]	3b	107.9384
If 3b< 133, then enter 133. If 3b ≥ 133, then enter 3b.	3c	133
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50 percent; otherwise enter 3c.	3d	133
If 2a ≥ 3d, then the warrant has been met and a traffic signal should be considered if not within 300 ft of another traffic signal. Otherwise, the warrant has not been met. Go to Step 4.		
Step 4: Estimate pedestrian delay.		
Pedestrian crossing distance, curb to curb (ft), L	4a	43
Pedestrian walking speed (ft.s), Sp	4b	3.5
Pedestrian start-up time and end clearance time (s), ts	4c	4
Critical gap required for crossing pedestrian (s), tc= (L/Sp) + ts OR [(4a/4b) + 4c)]	4d	16.28571429
Major road volume, total of both approaches or approach being crossed if median refuge island is present during peak hour (veh.h), Vmaj-d	4e	1760
Major road flow rate (veh/s), v = Vmaj-d/3600 OR [4e/3600]	4f	0.488888889
Average pedestrian delay (s/person), dp = ($e^{v\,tc}$ - v tc - 1) / v OR [($e^{4f \times 4d}$-4f x 4d - 1) / 4f]	4g	5851.16923
Total pedestrian delay (h), Dp=(dp x Vp) / 3600 OR [(4g x 2a) / 3600] (this is estimated delayfor all pedestrians crossing the major roadway without a crossing treatment - assumes 05 compliance). This calculated value can be replaced with the actual total pedestrian delay measured at the site.	4h	1.625324786
Step 5: Select treatment based upon total pedestrian delay and expected motorist compliance.		
Expected motorist compliance at pedestrian crossings in region, Comp = high or low	5a	LOW

Total Pedestrian Delay, Dp (from 4h) and Motorist Compliance, Comp (from 5a)	**Treatment Category** (see Descriptions of Sample Treatments for examples)
Dp ≥21.3h (Comp = high or low) OR 5.3h≤Dp<21.3 h and Comp = low	DO NOT USE RED
1.3h ≤ Dp < 21.3h and Comp = high or low) OR 5.3 ≤ Dp < 21.3 h and Comp = high	USE ACTIVE OR ENHANCED
Dp < 1.3 h (Comp = high or low)	DO NOT USE CROSSWALK

Roadway Configuration: 50' Wide, <35 mph, Vped = 3.5 ft/s



Legend:
Study Intersection
Striped Crosswalk
Enhanced-High Visibility/Active when Present
Red
Enhanced-High Visibility/Active when Present (if high compliance expected) OR Red (if low compliance expected)
Signal
No Treatment

Description of Treatment Types:		
Red:	Enhanced-High Visibility/Active when Present	
	Active When Present	*Enhanced/High Visibility*
Midblock Signal	In Roadway Warning Lights	In-Street Crossing Signs
Half Signal		High Visibility Signs/Markings
	Passive/Pushbutton Flashing Beacons	Pedestrian Refuge Islands
HAWK		Raised Crosswalks
	Pedestrian Crossing Flags	Curb Extensions
		Advanced Signage
	Rapid Rectangular Flashing Beacons	Advanced Stop/Yield Lines
		Constant Flashing Yellow Beacons

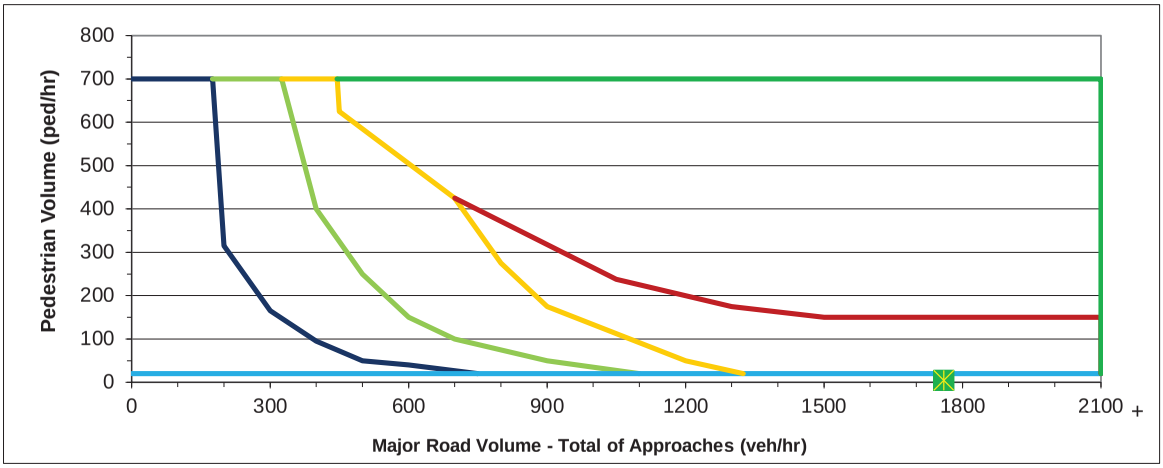
TCRP Report 112 - NCHRP Report 562 - Pedestrian Crossing Treatment Worksheet
Worksheet 1: Peak-Hour, 35 MPH or Less

Analyst and Site Information			
Analyst:	KRC	Major Street:	Commerce Boulevard
Analysis Date:	1/11/2020	Minor Street or Location:	Copeland Creek Trail Xing (Prpsd)
Data Collection Date:	Adjusted 2020 Volumes	Peak Hour:	PM

Step 1: Select worksheet (speed reflects posted or statutory speed limit or 85th percentile speed on the major street):		
a) Worksheet 1 - 35 mph or less		
b) Worksheet 2- exceeds 35 mph, communities with less than 10,000, or where major transit stop exists		
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a TCD type of treatment?		
Peak-hour pedestrian volume (ped/h), vp	2a	4
If 2a ≥ 20 ped/h, then go to Step 3.		
If 2a < 20 ped/h, then consider median refuge islands, curb extensions, traffic calming, etc. as feasible.		
Step 3: Does the crossing meet the pedestrian volume warrant for a traffic signal?		
Major road volume, total of both approaches during peak hour (veh/h), V maj-s	3a	1760
Minimum signal warrant volume for peak hour (use 3a for Vmaj-s), SC SC = 0.00021 Vmaj-s² - 0.74072 Vmaj-s + 734.125)/0.75 OR [(0.00021 3a² - 0.74072 3a + 734.125)/0.75]	3b	107.9384
If 3b< 133, then enter 133. If 3b ≥ 133, then enter 3b.	3c	133
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50 percent; otherwise enter 3c.	3d	133
If 2a ≥ 3d, then the warrant has been met and a traffic signal should be considered if not within 300 ft of another traffic signal. Otherwise, the warrant has not been met. Go to Step 4.		
Step 4: Estimate pedestrian delay.		
Pedestrian crossing distance, curb to curb (ft), L	4a	43
Pedestrian walking speed (ft.s), Sp	4b	3.5
Pedestrian start-up time and end clearance time (s), ts	4c	4
Critical gap required for crossing pedestrian (s), tc= (L/Sp) + ts OR [(4a/4b) + 4c)]	4d	16.28571429
Major road volume, total of both approaches or approach being crossed if median refuge island is present during peak hour (veh.h), Vmaj-d	4e	1760
Major road flow rate (veh/s), v = Vmaj-d/3600 OR [4e/3600]	4f	0.488888889
Average pedestrian delay (s/person), dp = ($e^{v\,tc}$ - v tc - 1) / v OR [($e^{4f \times 4d}$-4f x 4d - 1) / 4f]	4g	5851.16923
Total pedestrian delay (h), Dp=(dp x Vp) / 3600 OR [(4g x 2a) / 3600] (this is estimated delayfor all pedestrians crossing the major roadway without a crossing treatment - assumes 05 compliance). This calculated value can be replaced with the actual total pedestrian delay measured at the site.	4h	6.501299145
Step 5: Select treatment based upon total pedestrian delay and expected motorist compliance.		
Expected motorist compliance at pedestrian crossings in region, Comp = high or low	5a	LOW

Total Pedestrian Delay, Dp (from 4h) and Motorist Compliance, Comp (from 5a)	**Treatment Category** (see Descriptions of Sample Treatments for examples)
Dp ≥21.3h (Comp = high or low) OR 5.3h≤Dp<21.3 h and Comp = low	USE RED
1.3h ≤ Dp < 21.3h and Comp = high or low) OR 5.3 ≤ Dp < 21.3 h and Comp = high	USE ACTIVE OR ENHANCED
Dp < 1.3 h (Comp = high or low)	DO NOT USE CROSSWALK

Roadway Configuration: 50' Wide, <35 mph, Vped = 3.5 ft/s



Legend:
Study Intersection
Striped Crosswalk
Enhanced-High Visibility/Active when Present
Red
Enhanced-High Visibility/Active when Present (if high compliance expected) OR Red (if low compliance expected)
Signal
No Treatment

Description of Treatment Types:		
Red:	Enhanced-High Visibility/Active when Present	
	Active When Present	*Enhanced/High Visibility*
Midblock Signal	In Roadway Warning Lights	In-Street Crossing Signs
Half Signal		High Visibility Signs/Markings
	Passive/Pushbutton Flashing Beacons	Pedestrian Refuge Islands
HAWK		Raised Crosswalks
	Pedestrian Crossing Flags	Curb Extensions
		Advanced Signage
	Rapid Rectangular Flashing Beacons	Advanced Stop/Yield Lines
		Constant Flashing Yellow Beacons

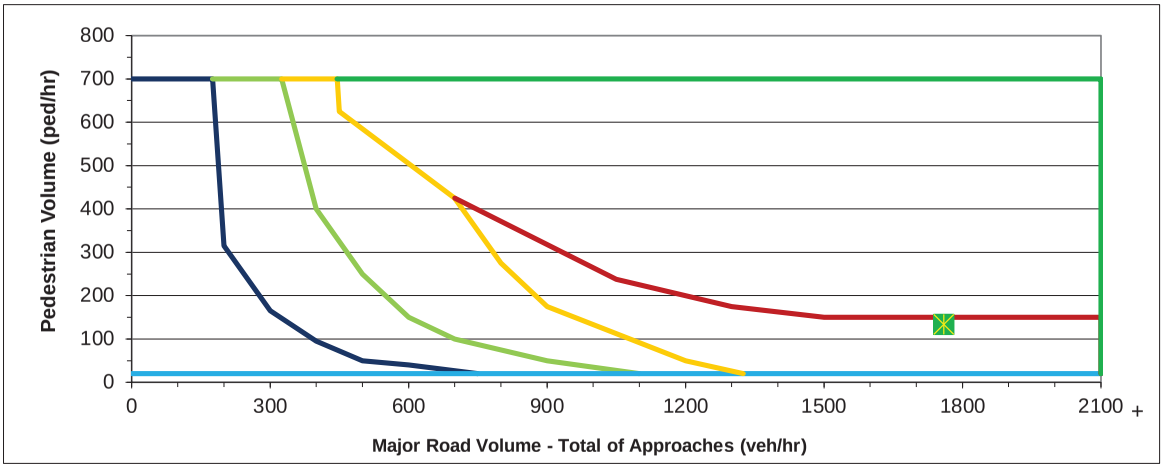
TCRP Report 112 - NCHRP Report 562 - Pedestrian Crossing Treatment Worksheet
Worksheet 1: Peak-Hour, 35 MPH or Less

Analyst and Site Information			
Analyst:	KRC	Major Street:	Commerce Boulevard
Analysis Date:	1/11/2020	Minor Street or Location:	Copeland Creek Trail Xing (Prpsd)
Data Collection Date:	Adjusted 2020 Volumes	Peak Hour:	PM

Step 1: Select worksheet (speed reflects posted or statutory speed limit or 85th percentile speed on the major street):		
a) Worksheet 1 - 35 mph or less		
b) Worksheet 2- exceeds 35 mph, communities with less than 10,000, or where major transit stop exists		
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a TCD type of treatment?		
Peak-hour pedestrian volume (ped/h), vp	2a	133
If 2a ≥ 20 ped/h, then go to Step 3.		
If 2a < 20 ped/h, then consider median refuge islands, curb extensions, traffic calming, etc. as feasible.		
Step 3: Does the crossing meet the pedestrian volume warrant for a traffic signal?		
Major road volume, total of both approaches during peak hour (veh/h), V maj-s	3a	1760
Minimum signal warrant volume for peak hour (use 3a for Vmaj-s), SC SC = 0.00021 Vmaj-s² - 0.74072 Vmaj-s + 734.125)/0.75 OR [(0.00021 3a² - 0.74072 3a + 734.125)/0.75]	3b	107.9384
If 3b< 133, then enter 133. If 3b ≥ 133, then enter 3b.	3c	133
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50 percent; otherwise enter 3c.	3d	133
If 2a ≥ 3d, then the warrant has been met and a traffic signal should be considered if not within 300 ft of another traffic signal. Otherwise, the warrant has not been met. Go to Step 4.		
Step 4: Estimate pedestrian delay.		
Pedestrian crossing distance, curb to curb (ft), L	4a	43
Pedestrian walking speed (ft.s), Sp	4b	3.5
Pedestrian start-up time and end clearance time (s), ts	4c	4
Critical gap required for crossing pedestrian (s), tc= (L/Sp) + ts OR [(4a/4b) + 4c)]	4d	16.28571429
Major road volume, total of both approaches or approach being crossed if median refuge island is present during peak hour (veh.h), Vmaj-d	4e	1760
Major road flow rate (veh/s), v = Vmaj-d/3600 OR [4e/3600]	4f	0.488888889
Average pedestrian delay (s/person), dp = ($e^{v\,tc}$ - v tc - 1) / v OR [($e^{4f \times 4d}$-4f x 4d - 1) / 4f]	4g	5851.16923
Total pedestrian delay (h), Dp=(dp x Vp) / 3600 OR [(4g x 2a) / 3600] (this is estimated delayfor all pedestrians crossing the major roadway without a crossing treatment - assumes 05 compliance). This calculated value can be replaced with the actual total pedestrian delay measured at the site.	4h	216.1681966
Step 5: Select treatment based upon total pedestrian delay and expected motorist compliance.		
Expected motorist compliance at pedestrian crossings in region, Comp = high or low	5a	LOW

Total Pedestrian Delay, Dp (from 4h) and Motorist Compliance, Comp (from 5a)	**Treatment Category** (see Descriptions of Sample Treatments for examples)
Dp ≥21.3h (Comp = high or low) OR 5.3h≤Dp<21.3 h and Comp = low	-
1.3h ≤ Dp < 21.3h and Comp = high or low) OR 5.3 ≤ Dp < 21.3 h and Comp = high	-
Dp < 1.3 h (Comp = high or low)	-
TRAFFIC SIGNAL WARRANTED	

Roadway Configuration: 50' Wide, <35 mph, Vped = 3.5 ft/s



Legend:
Study Intersection
Striped Crosswalk
Enhanced-High Visibility/Active when Present
Red
Enhanced-High Visibility/Active when Present (if high compliance expected) OR Red (if low compliance expected)
Signal
No Treatment

Description of Treatment Types:		
Red:	Enhanced-High Visibility/Active when Present	
	Active When Present	*Enhanced/High Visibility*
Midblock Signal	In Roadway Warning Lights	In-Street Crossing Signs
Half Signal		High Visibility Signs/Markings
	Passive/Pushbutton Flashing Beacons	Pedestrian Refuge Islands
HAWK		Raised Crosswalks
	Pedestrian Crossing Flags	Curb Extensions
		Advanced Signage
	Rapid Rectangular Flashing Beacons	Advanced Stop/Yield Lines
		Constant Flashing Yellow Beacons

Pedestrian Hybrid Beacon (HAWK) Signal Warrant

Low-Speed Roadway

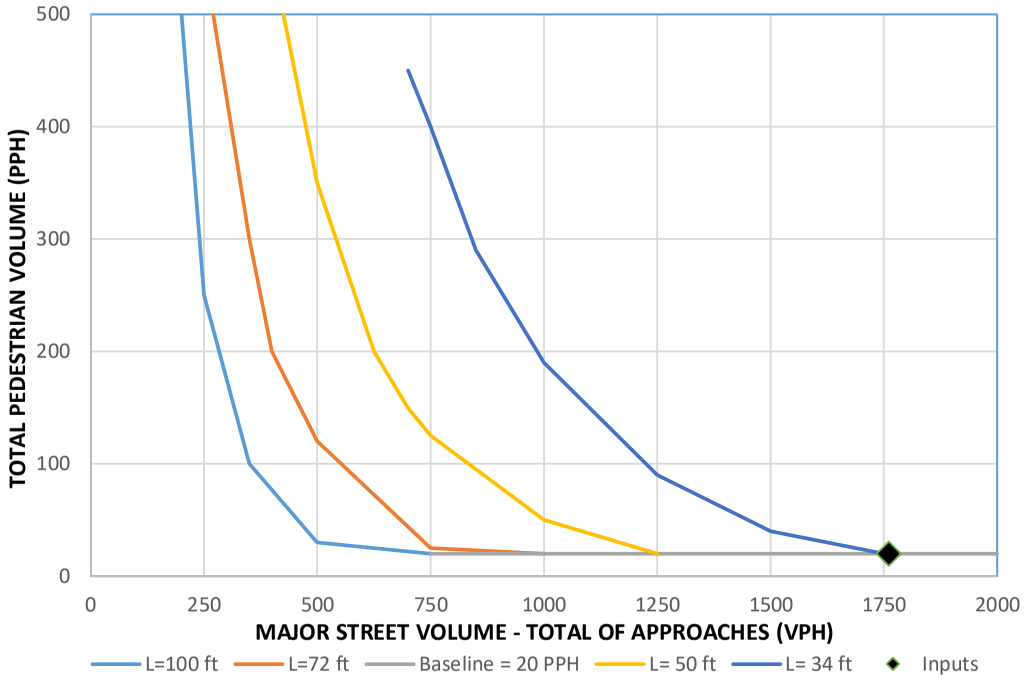
Project Name: Highway 101 Bicycle & Pedestrian Crossings Feasibility

Scenario: Future PM
Location: Commerce Blvd/Copeland Creek Trail Xing (Proposed)
Date of Count: Adjusted 2020 Volumes

Speed Limit: 35 mph
Crosswalk Length: 43 feet

Major Street Approach Volume: 1,760 VPH
Pedestrians Crossing: 20 PPH

WARRANT MET? **Yes**



Note: Installation of a HAWK Singal is warranted when the plotted point (see graph above) falls above the curve representing the corresponding crosswalk length (L).

If the length (L) of the crosswalk does not match one displayed on the graph, interpolate between existing curves to find the position of the curve representing the crosswalk length being analyzed.

Reference: California Manual on Uniform Traffic Control Devices (MUTCD) 2014 Edition

W-Trans 1/15/2021

Location: Commerce Blvd/Copeland Creek Trail Xing (Proposed)

Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations

Table 1 provides initial countermeasure options for various roadway conditions. Each matrix cell indicates possibilities that may be appropriate for designated pedestrian crossings. Not all of the countermeasures listed in the matrix cell should necessarily be installed at a crossing.

For multi-lane roadway crossings with vehicle AADTs exceeding 10,000, a marked crosswalk alone is typically insufficient (Zegeer, 2005). Under such conditions, more substantial crossing improvements (such as the refuge island, PHB, and RRFB) are also needed to prevent an increase in pedestrian crash potential.

Table 1. Application of pedestrian crash countermeasures by roadway feature.

Roadway Configuration	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
2 lanes (1 lane in each direction)	● 2 4 5 6	● 5 6 7 9	○ 5 6 ● ●	● 4 5 6	● 5 6 7 9	○ 5 6 ● ●	● 4 5 6 7 9	○ 5 6 7 9	○ 5 6 ●
3 lanes with raised median (1 lane in each direction)	● 2 3 4 5	● ● 5 7 9	○ ● 5 ● ●	○ 3 4 5 7 9	○ ● 5 ● ●	○ ● 5 ● ●	○ ● 4 5 7 9	○ ● 5 ● ●	○ ● 5 ●
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	● 2 3 4 5 6 7 9	● ● 5 6 7 9	○ ● 5 6 ●	○ 3 4 5 6 7 9	○ ● 5 6 ● ●	○ ● 5 6 ●	○ ● 4 5 6 7 9	○ ● 5 6 ●	○ ● 5 6 ●
4+ lanes with raised median (2 or more lanes in each direction)	● ● 5 7 8 9	● ● 5 7 8 9	○ ● 5 8 ●	○ ● 5 7 8 9	○ ● 5 ● 8 ●	○ ● 5 8 ●	○ ● 5 ● 8 ●	○ ● 5 8 ●	○ ● 5 8 ●
4+ lanes w/o raised median (2 or more lanes in each direction)	● ● 5 6 7 8 9	○ ● 5 ● 7 8 9	○ ● 5 ● 8 ●	○ ● 5 ● 7 8 9	○ ● 5 ● ● 8 ●	○ ● 5 ● 8 ●	○ ● 5 ● ● 8 ●	○ ● 5 ● 8 ●	○ ● 5 ● 8 ●

Given the set of conditions in a cell,

- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- ● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- ○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

1. High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
2. Raised crosswalk
3. Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
4. In-Street Pedestrian Crossing sign
5. Curb extension
6. Pedestrian refuge island
7. Rectangular Rapid-Flashing Beacon (RRFB)**
8. Road Diet
9. Pedestrian Hybrid Beacon (PHB)**

*Refer to Chapter 4, 'Using Table 1 and Table 2 to Select Countermeasures,' for more information about using multiple countermeasures.

**It should be noted that the PHB and RRFB are not both installed at the same crossing location.

This table was developed using information from: Zegeer, C.V., J.R. Stewart, H.H. Huang, P.A. Lagerwey, J. Feaganes, and B.J. Campbell. (2005). Safety effects of marked versus unmarked crosswalks at uncontrolled locations: Final report and recommended guidelines. FHWA, No. FHWA-HRT-04-100, Washington, D.C.; FHWA. Manual on Uniform Traffic Control Devices, 2009 Edition (revised 2012). Chapter 4F, Pedestrian Hybrid Beacons. FHWA, Washington, D.C.; FHWA. Crash Modification Factors (CMF) Clearinghouse. http://www.cmfclearinghouse.org/; FHWA. Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE). http://www.pedbikesafe.org/PEDSAFE/; Zegeer, C., R. Srinivasan, B. Lan, D. Carter, S. Smith, C. Sundstrom, N.J. Thirsk, J. Zegeer, C. Lyon, E. Ferguson, and R. Van Houten. (2017). NCHRP Report 841: Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments. Transportation Research Board, Washington, D.C.; Thomas, Thirsk, and Zegeer. (2016). NCHRP Synthesis 498: Application of Pedestrian Crossing Treatments for Streets and Highways. Transportation Research Board, Washington, D.C.; and personal interviews with selected pedestrian safety practitioners.

PRELIMINARY ESTIMATE FOR TOTAL PROJECT COSTS
Agency: City of Rohnert Park
Project Description: US 101 Bicycle and Pedestrian Overcrossing
Project Location: State Route 101, PM 13.516, Rohnert Park, Sonoma County
Feasibility Study Design Alternative A36

Prepared by Steven Grover & Associates
June 2021

Item No.	Item	Unit	Quantity	Unit Cost	Total Item Cost	Notes
General Overhead-Related Construction Items						
1	Progress Schedule (Critical Path Method)	LS	1	$ 7,000	$ 7,000	4. Specialty
2	Lead Compliance Plan	LS	1	$ 7,000	$ 7,000	4. Specialty
3	Prepare SWPPP	LS	1	$ 8,000	$ 8,000	5D. NPDES
4	Additional Water Pollution Control (SWPPPs and WPCP)	LS	1	$ 50,000	$ 50,000	5D. NPDES Supplement
5	Traffic Control System	LS	1	$ 400,000	$ 400,000	6C. Traffic Handling
6	Roadway Mobilization	LS	1	$ 458,900	$ 458,900	9. Roadway Mobilization (8.5% of 1-8)
7	Resident Engineers Office	LS	1	$ 31,200	$ 31,200	11. State Furnished
8	Traffic Management Plan - Public Information	LS	1	$ 20,000	$ 20,000	11. State Furnished
9	Additional State Furnished Materials and Expenses	LS	1	$ 107,970	$ 107,970	11. State Furnished (2% of 1-8)
10	Time-Related Overhead	LS	1	$ 266,500	$ 266,500	12. TRO (1.5%)
General Roadway Construction Items						
11	Roadway Excavation	CY	1527	$ 125	$ 190,875	1. Earthwork
12	Embankment Fill	CY	800	$ 100	$ 80,000	1. Earthwork
13	Clearing & Grubbing	LS	1	$ 25,000	$ 25,000	1. Earthwork
14	Develop Water Supply	LS	1	$ 10,000	$ 10,000	1. Earthwork
15	Hot Mix Asphalt (Type A)	TON	81	$ 230	$ 18,630	2. Pavement
16	Class 4 Aggregate Subbase	CY	75	$ 100	$ 7,500	2. Pavement
17	Interlock Pavers	SQFT	8200	$ 30	$ 246,000	2. Pavement
18	Minor Concrete (Curb)	LF	612	$ 20	$ 12,240	2. Pavement
19	Minor Concrete (Sidewalk)	CY	35	$ 2,000	$ 70,000	2. Pavement
20	36" Concrete Flared End Section	EA	2	$ 1,500	$ 3,000	3. Drainage
21	36" Reinforced Concrete Pipe	LF	80	$ 400	$ 32,000	3. Drainage
22	Drainage Items (General)	LS	1	$ 75,000	$ 75,000	3. Drainage
23	Remove Metal Beam Guard Railing	LF	100	$ 25	$ 2,500	4. Specialty
24	Remove Curb	LF	500	$ 25	$ 12,500	4. Specialty
25	CIP Concrete Seatwall	CY	330	$ 2,500	$ 825,000	4. Specialty
26	Minor Concrete (Curb Ramp)	EA	2	$ 2,750	$ 5,500	4. Specialty
27	West Culvert Extension	SQFT	384	$ 525	$ 201,600	4. Specialty
28	East Culvert Extension	SQFT	600	$ 525	$ 315,000	4. Specialty
29	Biological Mitigation	LS	1	$ 1,406,073	$ 1,406,073	5A. Mitigation
30	Landscaping (Planting/Irrigation)	LS	1	$ 85,000	$ 85,000	5B. Landscape & Irrigation
31	Bioretention Area	SF	1070	$ 30	$ 32,100	5B. Landscape & Irrigation
32	Irrigation Water Service	EA	1	$ 10,000	$ 10,000	5B. Landscape & Irrigation
33	Plant Establishment Work	LS	1	$ 10,000	$ 10,000	5B. Landscape & Irrigation
34	Maintain Existing Planted Areas	LS	1	$ 10,000	$ 10,000	5B. Landscape & Irrigation
35	Remove Tree	EA	14	$ 800	$ 11,200	5B. Landscape & Irrigation
36	Permanent Erosion Control	LS	1	$ 100,000	$ 100,000	5C. Erosion
37	Temporary Water Pollution Control	LS	1	$ 450,000	$ 450,000	5D. NPDES
38	Temporary Creek Diversion System (TCDS)	EA	2	$ 60,000	$ 120,000	5D. NPDES
39	Lighting and Sign Illumination	LS	1	$ 25,000	$ 25,000	6A. Traffic Electrical
40	Hawk Signal	LS	1	$ 300,000	$ 300,000	6A. Traffic Electrical
41	Maintain Existing Traffic Mgmt System Elements During Construction	LS	1	$ 50,000	$ 50,000	6A. Traffic Electrical
42	Fiber Optic Conduit System	LS	1	$ 10,000	$ 10,000	6A. Traffic Electrical
43	Construction Area Signs	LS	1	$ 10,000	$ 10,000	6B. Traffic Signage & Striping
44	Signing and Striping (Roadway)	LS	1	$ 45,000	$ 45,000	6B. Traffic Signage & Striping
45	Portable Changeable Message Signs	LS	1	$ 10,000	$ 10,000	6C. Traffic Management
46	ADA Items	LS	1	$ 13,000	$ 13,000	8A. Minor (0.25% of 1-7)
47	Bike Path Items	LS	1	$ 13,000	$ 13,000	8B. Minor (0.25% of 1-7)
48	Other Minor Items	LS	1	$ 131,000	$ 131,000	8C. Minor (2.5% of 1-7)
49	Supplemental Construction	LS	1	$ 270,000	$ 270,000	10. Supplemental (5% of 1-8)
50					$ -	
	Roadway Construction Items Subtotal				$ 6,600,288	
	Roadway Construction Items Contingencies			35%	$ 2,310,101	CT recm. 30%-50% for Pre-PSR (Feasibility)
	Total Roadway				$ 8,910,388	

Item No.	Item	Unit	Quantity	Unit Cost	Total Item Cost	Notes
General Structure Construction Items						
51	Principal Span Structure	SQFT	2520	$ 1,750	$ 4,410,000	Butterfly Steel Tied-Arch
52	West Approach Structure	SQFT	4840	$ 600	$ 2,904,000	CIP Box Girder
53	East Approach Structure	SQFT	3850	$ 550	$ 2,117,500	CIP Box Girder
54	West Approach Walls	SQFT	250	$ 200	$ 50,000	U-Frame Retaining Wall
55	East Approach Walls	SQFT	1930	$ 145	$ 279,850	MSE Wall, Double
56	East Channel Retaining Wall	SQFT	650	$ 200	$ 130,000	Cantilever Concrete Wall
57					$ -	
58					$ -	
59					$ -	
60					$ -	
	Structure Construction Items Subtotal				$ 9,891,350	
	Structure Construction Mobilization			10%	$ 989,135	
	Structure Construction Contingency			25%	$ 2,472,838	CT recm. 30%-50% for Pre-PSR (Feasibility)
	Total Structures				$ 13,353,323	
	Total Construction Items and Contingencies Cost				$ 22,263,711	

Project Delivery Costs				
Preliminary Engineering (PE)				
Project Initiation Document (PID)	2%	$ 445,274	ACTC recm. 3%	
Project Approval and Environmental Document (PA&ED)	3%	$ 667,911	ACTC recm. 3%; CT recm. 5%	
Plans, Specifications, and Estimates (PS&E)	12%	$ 2,671,645	ACTC recm. 13%; CT recm. 10%	
Total PE		$ 3,784,831		
Right of Way (RW)				
Acquisitions and Utilities		$ 193,805	OH & UG relocs.; minor SCWA & city parcels; PTE&C	
Right of Way Engineering	4%	$ 7,752	ACTC recm. 5%; CT recm. 5%	
Total RW		$ 201,557		
Construction Engineering (CE)				
Design Services During Construction (DSDC)	2%	$ 445,274	ACTC recm. 2%	
Construction Staking	1%	$ 222,637	ACTC recm. 2.5%	
Construction Support	14%	$ 3,116,920	ACTC recm. 13%; CT recm. 15%	
Total CE		$ 3,784,831		
Total Project Delivery Costs		$ 7,771,219		
TOTAL PROJECT COST		**$ 30,034,930**		

Escalated Project Costs			
PID	4.2%	$ 463,976	Assumes 2022 PID
PA&ED	4.2%	$ 725,194	Assumes 2023 PA&ED
PS&E	4.2%	$ 3,022,609	Assumes 2024 PS&E
RW	4.2%	$ 219,197	Assumes 2024 RW
CE	4.2%	$ 4,523,716	Assumes 2025 Construction Support
Roadway	1%-3%	$ 10,336,000	Assumes 2026 Construction
Structures	1%-3%	$ 15,483,000	Assumes 2026 Construction
Total Escalated Project Cost		$ 34,773,692	

PRELIMINARY ESTIMATE FOR TOTAL PROJECT COSTS
Agency: City of Rohnert Park
Project Description: US 101 Bicycle and Pedestrian Overcrossing
Project Location: State Route 101, PM 13.516, Rohnert Park, Sonoma County
Feasibility Study Design Alternative B15

Prepared by Steven Grover & Associates
June 2021

Item No.	Item	Unit	Quantity	Unit Cost	Total Item Cost	Notes
General Overhead-Related Construction Items						
1	Progress Schedule (Critical Path Method)	LS	1	$ 7,000	$ 7,000	4. Specialty
2	Lead Compliance Plan	LS	1	$ 7,000	$ 7,000	4. Specialty
3	Prepare SWPPP	LS	1	$ 8,000	$ 8,000	5D. NPDES
4	Additional Water Pollution Control (SWPPPs and WPCP)	LS	1	$ 50,000	$ 50,000	5D. NPDES Supplement
5	Traffic Control System	LS	1	$ 400,000	$ 400,000	6C. Traffic Handling
6	Roadway Mobilization	LS	1	$ 320,000	$ 320,000	9. Roadway Mobilization (8.5% of 1-8)
7	Resident Engineers Office	LS	1	$ 31,200	$ 31,200	11. State Furnished
8	Traffic Management Plan - Public Information	LS	1	$ 20,000	$ 20,000	11. State Furnished
9	Additional State Furnished Materials and Expenses	LS	1	$ 75,300	$ 75,300	11. State Furnished (2% of 1-8)
10	Time-Related Overhead	LS	1	$ 254,400	$ 254,400	12. TRO (1.5%)
General Roadway Construction Items						
11	Roadway Excavation	CY	150	$ 125	$ 18,750	1. Earthwork
12	Clearing & Grubbing	LS	1	$ 25,000	$ 25,000	1. Earthwork
13	Develop Water Supply	LS	1	$ 10,000	$ 10,000	1. Earthwork
14	Hot Mix Asphalt (Type A)	TON	45	$ 230	$ 10,350	2. Pavement
15	Class 2 Aggregate Base	CY	65	$ 100	$ 6,500	2. Pavement
16	Interlock Pavers	SQFT	6,490	$ 30	$ 194,700	2. Pavement
17	Minor Concrete (Curb)	LF	100	$ 20	$ 2,000	2. Pavement
18	Minor Concrete (Curb and Gutter)	LF	140	$ 35	$ 4,900	2. Pavement
19	Minor Concrete (Sidewalk)	CY	35	$ 2,000	$ 70,000	2. Pavement
20	Drainage Items (General)	LS	1	$ 75,000	$ 75,000	3. Drainage
21	Chain Link Fence (Type CL-6)	LF	400	$ 50	$ 20,000	4. Specialty
22	West Culvert Extension	SQFT	384	$ 525	$ 201,600	4. Specialty
23	East Culvert Extension	SQFT	600	$ 525	$ 315,000	4. Specialty
24	Biological Mitigation	LS	1	$ 1,019,105	$ 1,019,105	5A. Mitigation
25	Landscaping (Planting/Irrigation)	LS	1	$ 85,000	$ 85,000	5B. Landscape & Irrigation
26	Bioretention Area	SF	780	$ 30	$ 23,400	5B. Landscape & Irrigation
27	Irrigation Water Service	EA	1	$ 10,000	$ 10,000	5B. Landscape & Irrigation
28	Plant Establishment Work	LS	1	$ 10,000	$ 10,000	5B. Landscape & Irrigation
29	Maintain Existing Planted Areas	LS	1	$ 10,000	$ 10,000	5B. Landscape & Irrigation
30	Remove Tree	EA	14	$ 800	$ 11,200	5B. Landscape & Irrigation
31	Permanent Erosion Control	LS	1	$ 100,000	$ 100,000	5C. Erosion
32	Temporary Water Pollution Control	LS	1	$ 450,000	$ 450,000	5D. NPDES
33	Temporary Creek Diversion System (TCDS)	EA	2	$ 60,000	$ 120,000	5D. NPDES
34	Lighting and Sign Illumination	LS	1	$ 25,000	$ 25,000	6A. Traffic Electrical
35	Hawk Signal	LS	1	$ 300,000	$ 300,000	6A. Traffic Electrical
36	Maintain Existing Traffic Mgmt System Elements During Construction	LS	1	$ 50,000	$ 50,000	6A. Traffic Electrical
37	Fiber Optic Conduit System	LS	1	$ 10,000	$ 10,000	6A. Traffic Electrical
38	Construction Area Signs	LS	1	$ 10,000	$ 10,000	6B. Traffic Signage & Striping
39	Signing and Striping (Roadway)	LS	1	$ 45,000	$ 45,000	6B. Traffic Signage & Striping
40	Portable Changeable Message Signs	LS	1	$ 10,000	$ 10,000	6C. Traffic Management
41	ADA Items	LS	1	$ 9,000	$ 9,000	8A. Minor (0.25% of 1-7)
42	Bike Path Items	LS	1	$ 9,000	$ 9,000	8B. Minor (0.25% of 1-7)
43	Other Minor Items	LS	1	$ 91,400	$ 91,400	8C. Minor (2.5% of 1-7)
44	Supplemental Construction	LS	1	$ 188,400	$ 188,400	10. Supplemental (5% of 1-8)
45					$ -	
46					$ -	
47					$ -	
48					$ -	
49					$ -	
50					$ -	
	Roadway Construction Items Subtotal				$ 4,713,205	
	Roadway Construction Items Contingencies			35%	$ 1,649,622	CT recm. 30%-50% for Pre-PSR (Feasibility)
	Total Roadway				$ 6,362,827	

Item No.	Item	Unit	Quantity	Unit Cost	Total Item Cost	Notes
General Structure Construction Items						
51	Principal Span Structure	SQFT	2744	$ 1,850	$ 5,076,400	Skewed Steel Tied-Arch
52	West Approach Structure	SQFT	5292	$ 615	$ 3,254,580	CIP Box Girder
53	East Approach Structure	SQFT	3080	$ 550	$ 1,694,000	CIP Box Girder
54	West Approach Walls	SQFT	1000	$ 200	$ 200,000	U-Frame Retaining Wall
55	East Approach Walls	SQFT	2240	$ 145	$ 324,800	MSE Wall, Double
56					$ -	
57					$ -	
58					$ -	
59					$ -	
60					$ -	
	Structure Construction Items Subtotal				$ 10,549,780	
	Structure Construction Mobilization			10%	$ 1,054,978	
	Structure Construction Contingency			25%	$ 2,637,445	CT recm. 30%-50% for Pre-PSR (Feasibility)
	Total Structures				$ 14,242,203	
	Total Construction Items and Contingencies Cost				$ 20,605,030	

Project Delivery Costs			
Preliminary Engineering (PE)			
Project Initiation Document (PID)	2.5%	$ 515,126	ACTC recm. 3%
Project Approval and Environmental Document (PA&ED)	3%	$ 618,151	ACTC recm. 3%; CT recm. 5%
Plans, Specifications, and Estimates (PS&E)	12%	$ 2,472,604	ACTC recm. 13%; CT recm. 10%
Total PE		$ 3,605,880	
Right of Way (RW)			
Acquisitions and Utilities		$ 436,612	OH & UG relocs.; trench; minor SCWA & city parcels; PTE&C
Right of Way Engineering	4%	$ 17,464	ACTC recm. 5%; CT recm. 5%
Total RW		$ 454,076	
Construction Engineering (CE)			
Design Services During Construction (DSDC)	2%	$ 412,101	ACTC recm. 2%
Construction Staking	1%	$ 206,050	ACTC recm. 2.5%
Construction Support	14%	$ 2,884,704	ACTC recm. 13%; CT recm. 15%
Total CE		$ 3,502,855	
Total Project Delivery Costs		$ 7,562,812	

TOTAL PROJECT COST **$ 28,167,842**

Escalated Project Costs			
PID	4.2%	$ 536,761	Assumes 2022 PID
PA&ED	4.2%	$ 671,166	Assumes 2023 PA&ED
PS&E	4.2%	$ 2,797,420	Assumes 2024 PS&E
RW	4.2%	$ 493,816	Assumes 2024 RW
CE	4.2%	$ 4,186,692	Assumes 2025 Construction Support
Roadway	1%-3%	$ 7,378,000	Assumes 2026 Construction
Structures	1%-3%	$ 16,514,000	Assumes 2026 Construction
Total Escalated Project Cost		$ 32,577,856	

Aerial view northeast over Rohnert Park at Copeland Creek (SGA, 2021)

Rohnert Park HIGHWAY 101 BIKE & PEDESTRIAN CROSSING

FEASIBILITY STUDY ADDENDUM

SUPPLEMENTAL HYDRAULIC ASSESSMENT OF COPELAND CREEK

Rohnert Park

Prepared by

STEVEN GROVER & ASSOCIATES ARCHITECTURE ENGINEERING

Aerial view southwest from Commerce Blvd and Copeland Creek (SGA, 2021)

ROHNERT PARK HIGHWAY 101 BIKE & PEDESTRIAN CROSSING FEASIBILITY STUDY ADDENDUM

SUPPLEMENTAL HYDRAULIC ASSESSMENT OF COPELAND CREEK

June 2022

INTRODUCTION

PURPOSE AND SCOPE OF ADDENDUM

This Feasibility Study Addendum (Addendum) was developed to determine whether the existing Copeland Creek culvert under US 101 or the downstream conditions at/towards the Laguna de Santa Rosa, is the primary cause of flooding on the upstream side of US 101.

If the existing culvert is determined to be the primary issue, this Addendum would also define the geometric requirements for two potential future conditions for the culvert that would be appropriate for hydraulic conveyance:

1. Addition of a 12-foot by 10-foot reinforced concrete box (RCB) barrel to the existing Copeland Creek culvert under US 101; and,
2. Complete replacement of existing Copeland Creek culvert under US 101.

Conceptual rendering of main span butterfly arch over US 101 and west side touchdown area (SGA, 2021)

Conceptual rendering of main span butterfly arch over US 101 and west side touchdown area (SGA, 2021)

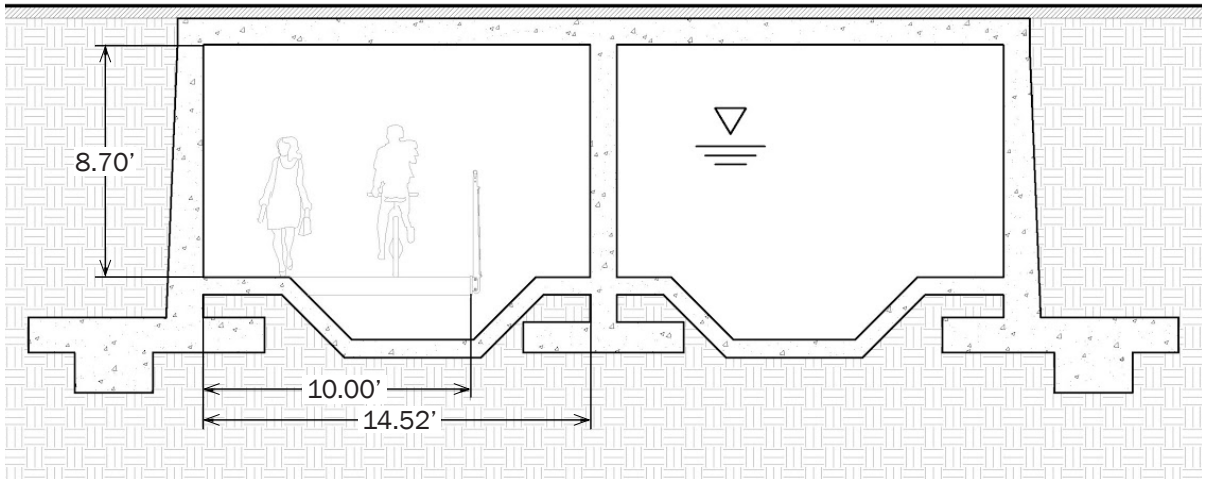
BACKGROUND

On October 26, 2021, SGA provided the Rohnert Park City Council with an update about the Highway 101 Bike and Pedestrian Crossing Feasibility Study (Study), which included a hydraulic assessment of the existing Copeland Creek culvert and upstream conditions. The assessment found that the existing capacity of the culvert is not large enough to contain 100-Year Flows, with flood levels exceeding top-of-bank elevations by as much as 2.7 feet immediately east of US 101. However, the assessment did not explicitly identify whether flooding conditions downstream of the existing culvert toward the Laguna De Santa Rosa results in flooding on the upstream side of US 101 culvert.

During the City Council's discussion, the City Manager suggested that the City should further explore adding a barrel to the existing two-barreled cross culvert under US 101 at Copeland Creek to address flooding. The City Manager proposed that the elevation of a new culvert barrel could be high enough to typically remain dry and be used by cyclists and pedestrians, but also serve as additional flood control, if necessary.

Ultimately, the City Council unanimously supported the "butterfly" arch bike/ped overcrossing concept at Copeland Creek, and for the overcrossing to be designed so as not to preclude the City from adding an additional culvert barrel or otherwise addressing flood issues in the future.

Following the City Council meeting, City staff directed the SGA team to assess the viability of addressing existing flooding issues by adding to, or improving, the existing RCB culvert system under US 101 at Copeland Creek per the City Manager's suggestion.



Cross-sectional drawing from the Feasibility Study depicting existing Copeland Creek culvert conditions and potential bike/ped path with safety railing (SGA, 2020)

Photo of the existing Copeland Creek culvert under US 101 (SGA, 2021)

Aerial view west over Copeland Creek, upstream of US 101 and Commerce Blvd (SGA, 2021)

In December 2014, Copeland Creek floodwaters reach top of bank levels, upstream of US 101 and Commerce Blvd (Sonoma State Star, 2014)

DATA & METHODOLOGY

Using As-Built plans provided by Sonoma Water, titled “Laguna-Mark West Zone IA Copeland Creek Channel” and dated May 1962, the SGA team modeled supplemental creek geometries (i.e., channel widths, depths, side slopes) and flowline slopes of Copeland Creek between US 101 and the Laguna de Santa Rosa.

The Federal Emergency Management Agency Flood Insurance Study (FIS), dated May 15, 2020 and included in the Addendum Appendix, was used to derive 100-Year Flows and Manning’s roughness coefficients, mimicking the coefficients of other nearby, similar creeks that have been modeled. The FIS provides the flows for Laguna de Santa Rosa directly upstream and downstream of its confluence with Copeland Creek, and the difference between the upstream and downstream flows was interpreted as the contribution from the Copeland Creek. Lastly, the dimensions of the existing double-barrel culvert under US 101 were taken from Caltrans As-Built plans.

The data were used to create a one-dimensional HEC-RAS model, including a model of the existing Copeland Creek culvert. Other existing upstream and downstream structures, bridges, channel deviations, and related appurtenances, were not considered in the preliminary model. Figure 1 is a plan view of the river reach modeled, as well as the locations of the cross-sections modeled.

Lastly, on April 25, 2022, Sonoma Water confirmed to City staff that the agency had no plans to improve Copeland Creek or the Laguna de Santa Rosa.

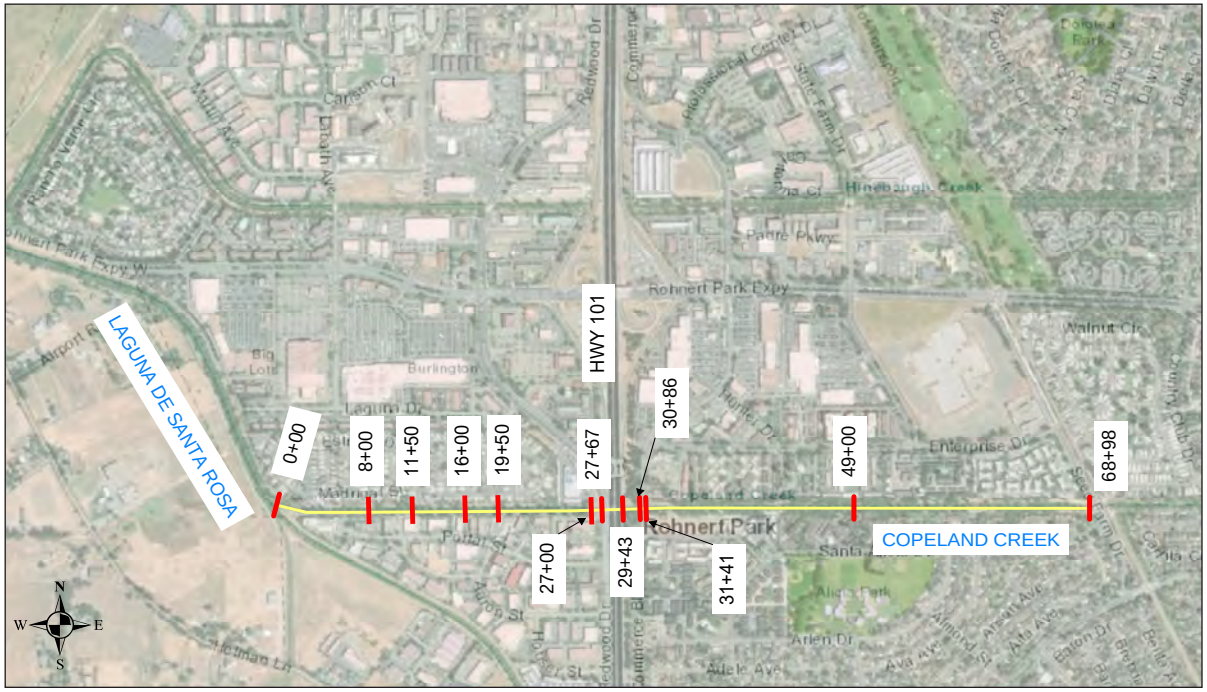


Figure 1. HEC-RAS Alignment, not to scale (BKF Engineers, 2022)

As the results in Table 1 show, Copeland Creek, between US 101 and the Laguna de Santa Rosa, has a channel depth of 10 feet between top of bank and minimum elevation. Furthermore, the creek flows at a maximum depth of 11 feet, downstream of US 101. Therefore, Copeland Creek's existing geometry, or cross-sectional area, between the US 101 and the Laguna de Santa Rosa, is not large enough to contain 100-Year Flows, and the creek experiences flows one foot above channel limits.

ASSESSMENT & FINDINGS OF EXISTING HYDRAULICS

Table 1. HEC-RAS Output Copeland Creek Existing 100-Year Storm Event Hydraulics (BKF Engineers, 2022)

River Station	Peak Flow (cfs)[6]	Minimum Channel Elev. (ft)	Flow Depth (ft)	Water Surface Elevation (ft)[1,2, 4]	Top of Bank Elevation (ft)	Flood Depth (ft)[3]	Critical Water Surface (ft)	Energy Grade Elevation (ft)	Energy Grade Slope (ft/ft)	Velocity Channel (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Channel
Copeland Creek													
6898	2,170	93.90	11.8	105.72	105.10	0.6	0	105.82	0.001	2.5	857	200	0.22
4900	2,170	92.14	11.8	103.95	103.34	0.6	0	104.05	0.001	2.5	855	200	0.22
3141	2,170	90.56	11.9	102.41	101.76	0.6	0	102.51	0.001	2.5	863	200	0.21
3086	2,170	90.51	11.7	102.22	101.71	0.5	0	102.42	0.003	3.6	606	200	0.36
2943	2,170	89.66	12.5	102.12	100.86	1.3	94.47	102.23	0.001	2.6	831	144	0.19
2767	Culvert												
2767	2,170	89.64	11.0	100.62	99.64	1.0	0	100.85	0.002	3.9	560	121	0.32
2700	2,170	89.64	10.8	100.48	99.64	0.8	0	100.75	0.001	4.2	543	105	0.28
1950	2,170	89.00	10.3	99.29	99.00	0.3	0	99.62	0.002	4.6	485	105	0.32
1600	2,170	88.40	10.3	98.68	98.40	0.3	0	99	0.002	4.6	484	105	0.32
1150	2,170	87.70	10.1	97.83	97.70	0.1	0	98.18	0.002	4.7	468	105	0.34
800	2,170	87.10	10.0	97.13	97.10	0.0	93.02	97.48	0.002	4.8	457	105	0.34
0	2,170	85.77	6.0	91.77	95.77	-4.0	91.69	93.64	0.019	11.0	198	51	0.98

Notes:

1. Copeland Creek tailwater set to elevation 91.77 per FEMA FIRM Map.
2. Positive value indicates flow is above channel's top of bank elevation.
3. Manning's n value set to 0.045 mimicking Laguna De Santa Rosa per FEMA FIS.
4. Channel slope and geometry modeled per as-builts
5. Peak flows per FEMA FIS 06097CV001F Dated May 15, 2020.

CONCLUSION

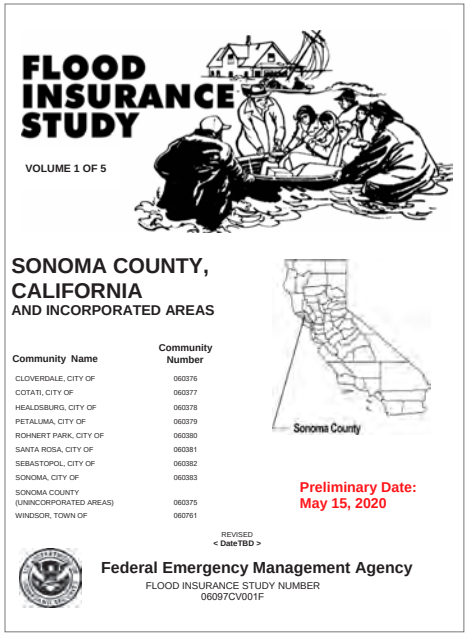
Based on the findings, this Addendum determines that flooding downstream of US 101 contributes significantly to upstream flooding, and the flooding would occur along Copeland Creek, regardless of improvements to the culvert under US 101.

Furthermore, Sonoma Water does not have any planned improvements for the Copeland Creek channel or the Laguna de Santa Rosa, so this Addendum did not pursue further modeling, analysis, or design of a new bike/ped undercrossing and flood mitigation concept.

Given the 10-foot vertical and 12-foot horizontal clearance guidelines for a bike/ped undercrossing as discussed in the Study, it is not feasible to add an RCB barrel for bike/ped use at an elevation that would keep it from flooding, while simultaneously offering additional hydraulic capacity to benefit existing flooding conditions on the upstream side of US 101.

This Addendum concludes that increasing the capacity of the culvert would not solve the flooding problem. Floodwaters will fill the channel between US 101 and the Laguna de Santa Rosa, before subsequently filling the culvert and then contributing to flooding on the east side of the highway. Although it may be possible to expand the capacity of the Copeland Creek channel downstream of US 101 to hold more water and extend the time before flooding occurs on the upstream side of US 101, further study would be needed to assess the feasibility of this approach and its potential benefits.

View west from Redwood Dr over the Copeland Creek channel (SGA, 2021)


FLOOD INSURANCE STUDY

VOLUME 1 OF 5

SONOMA COUNTY, CALIFORNIA
AND INCORPORATED AREAS

Community Name	Community Number
CLOVERDALE, CITY OF	060376
COTATI, CITY OF	060377
HEALDSBURG, CITY OF	060378
PETALUMA, CITY OF	060379
ROHNERT PARK, CITY OF	060380
SANTA ROSA, CITY OF	060381
SEBASTOPOL, CITY OF	060382
SONOMA, CITY OF	060383
SONOMA COUNTY (UNINCORPORATED AREAS)	060375
WINDSOR, TOWN OF	060761

Sonoma County

Preliminary Date: May 15, 2020

REVISED
< DateTBD >

Federal Emergency Management Agency
FLOOD INSURANCE STUDY NUMBER
06097CV001F

Flood Insurance Study (Federal Emergency Management Agency, 2020)

Table 4. Summary of Discharges (continued)

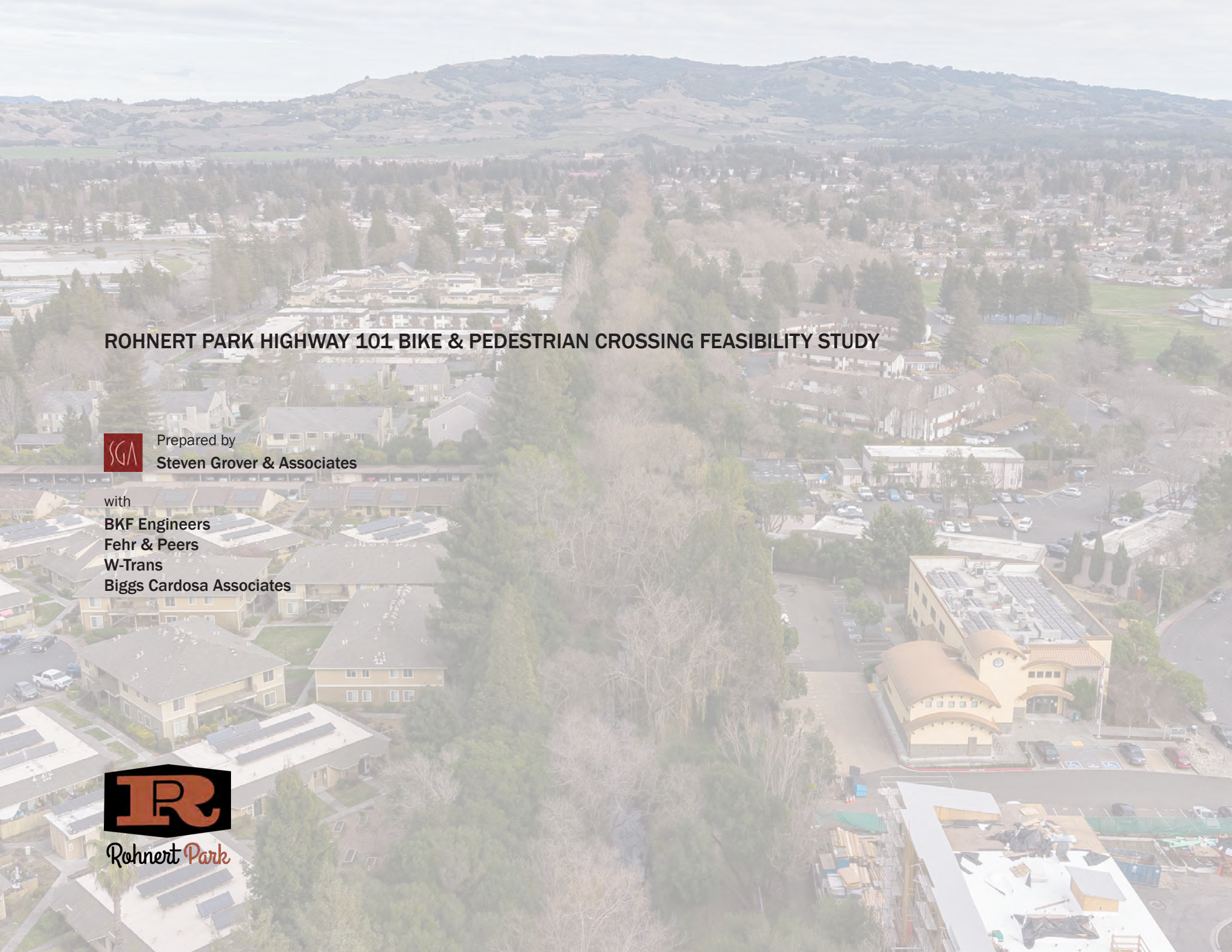
Flooding Source and Location	Drainage Area (Square miles)	Peak Discharges (Cubic Feet per Second)			
		10-percent	2-percent	1-percent	0.2-percent
KELLY CREEK					
Above Thompson Creek	0.90	210	325	380	520
KIZER CREEK					
Upstream of confluence with Petaluma Creek	1.33	322	420	462	555
At Middle Two Rock Road	0.46	170	220	245	290
LAGUNA DE SANTA ROSA					
Upstream of confluence with Mark West Creek	170.0	21,100	30,300	35,100	44,900
Downstream of confluence of Santa Rosa Flood Control Channel	166.0	16,800	23,900	28,000	35,700
Upstream of confluence of Santa Rosa Flood Control Channel	87.4	14,000	20,100	23,300	30,800
Upstream of confluence of Irwin Creek	*	13,200	19,100	22,000	29,200
Upstream of confluence of Gravenstein Creek	*	12,300	18,000	20,500	27,200
Upstream of confluence of Pleasant Hill Creek	*	11,600	16,900	19,300	25,600
Upstream of confluence of Roseland Creek	*	10,800	15,800	18,000	23,900
Upstream of confluence of Blucher Creek	*	9,570	14,000	15,950	21,200
Upstream of confluence of Colgan Creek	*	7,710	11,200	12,850	17,100
At Stony Point Road	*	7,170	10,400	11,950	15,900
Downstream of confluence of Hinebaugh Creek	*	5,550	7,900	9,250	12,000
Upstream of confluence of Hinebaugh Creek	*	2,280	3,250	3,800	5,000
Upstream of confluence with Copeland Creek	*	977	1,410	1,630	2,120
At U.S. Highway 101	3.8	720	1,250	1,500	2,100
Upstream of confluence of Cotati Creek	1.6	320	540	660	930

*Data Not Available

COPELAND = 3,800 - 1,630 = 2,170 cfs

Table 11. Manning's "n" Values (continued)

Flooding Source	Main Channel	Overbank Area	Bridge and Culvert Structures
Kizer Creek	0.045 – 0.100	0.050 – 0.090	0.020 – 0.025
Laguna de Santa Rose	0.035 – 0.055	0.035 – 0.070	0.020 – 0.080
Lakeville Street to Section Q	0.015	0.050	*



ROHNERT PARK HIGHWAY 101 BIKE & PEDESTRIAN CROSSING FEASIBILITY STUDY

Prepared by
Steven Grover & Associates

with
BKF Engineers
Fehr & Peers
W-Trans
Biggs Cardosa Associates

Rohnert Park