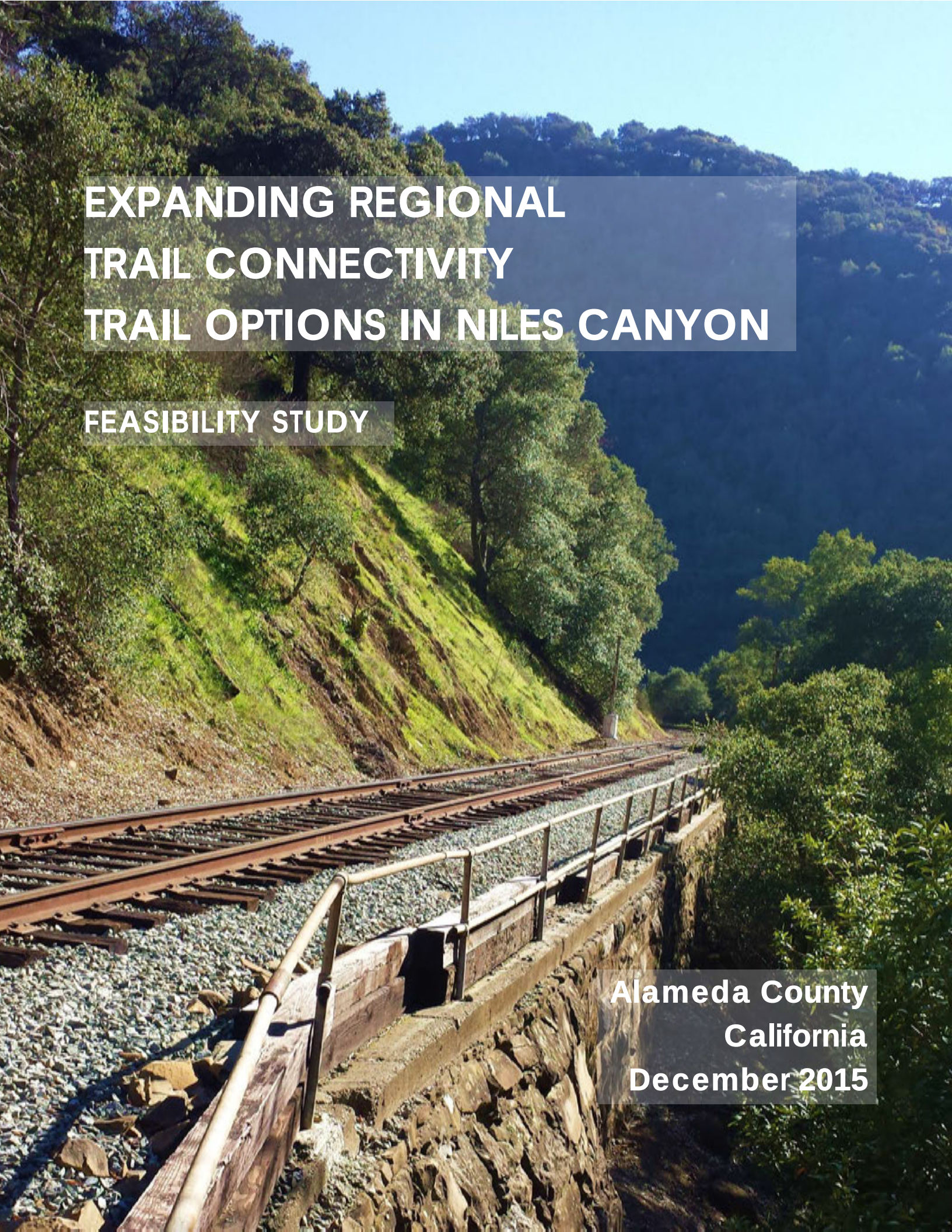

EXPANDING REGIONAL TRAIL CONNECTIVITY
TRAIL OPTIONS IN NILES CANYON

FEASIBILITY STUDY

Alameda County
California
December 2015

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INTRODUCTION

Niles Canyon is located in an unincorporated area of Alameda County lying between the Niles district of the City of Fremont and the Town of Sunol as shown in Figure 1. Formed by Alameda Creek, the Canyon's steep slopes, stunning vistas, dense vegetation, and wildlife have made it a destination for visitors for more than 100 years.

In the early part of the last century, trains operated by the Southern Pacific Railroad brought residents of San Francisco and Oakland to recreational destinations within the Canyon. As the road network improved, State Route 84, which runs through the Canyon, became a popular route to visit the Canyon.

With an increased awareness in protecting water resources of Alameda Creek, regional planners have decreased public access to the Canyon from Highway 84. This coupled with an increase in traffic along the highway has groups seeking to expand access for pedestrians, bicyclists, and equestrians within the Canyon.

Alameda Creek originally formed Niles Canyon.

The effort to expand non-motorized access to the Canyon has at least a 40-year history. A 1975 report prepared for the East Bay Regional Park district entitled, "Niles Canyon Bike Trail Study" offered options to construct a trail adjacent to the State Highway. Subsequent studies developed in the 1980's and 1990's advanced the concept while evaluating potential environmental impacts.

The East Bay Regional Park District's Master Plan defines the goal of establishing a trail through the Canyon, known as segment 8A. The District, working in collaboration with its project partners including Alameda County, Alameda County Water District, and San Francisco Public Utility Commission embarked on a study to evaluate options to improve access within the Canyon.

An original segment of the transcontinental railway runs through Niles Canyon. Operated by Southern Pacific, the railroad brought visitors to Niles Canyon in the early part of the 20th century. The Pacific Locomotive Association now operates the Niles Canyon Railway along the tracks.

As shown in Figure 2, this study evaluates three trail segments including:

Trail Segment 1 - Niles to Sunol Multi-Use Trail – This will create a six-mile long ten feet wide, paved pathway from Vallejo Mill Park near the intersection of Mission Boulevard with the Town of Sunol.

Trail Segment 2- Bay Area Ridge Trail Railroad Crossing – This will complete a crossing of the Niles Canyon Railway tracks near Vallejo Mill Park to allow for a connection to the future Bay Area Ridge Trail.

Trail Segment 3- Connection to the Vargas Plateau – This will provide a non-paved trail from the Sunol Water Temple to the future Vargas Plateau Regional Park currently under development by East Bay Regional Parks.

This document summarizes the opportunities and constraints, defines costs, approvals, and outlines potential next steps to advance development of these new trail segments.

The deactivated Sunol Aqueduct runs above ground providing an accessible path through potions of the Canyon. The aqueduct is popular destination for locals who now know it as the "secret sidewalk."

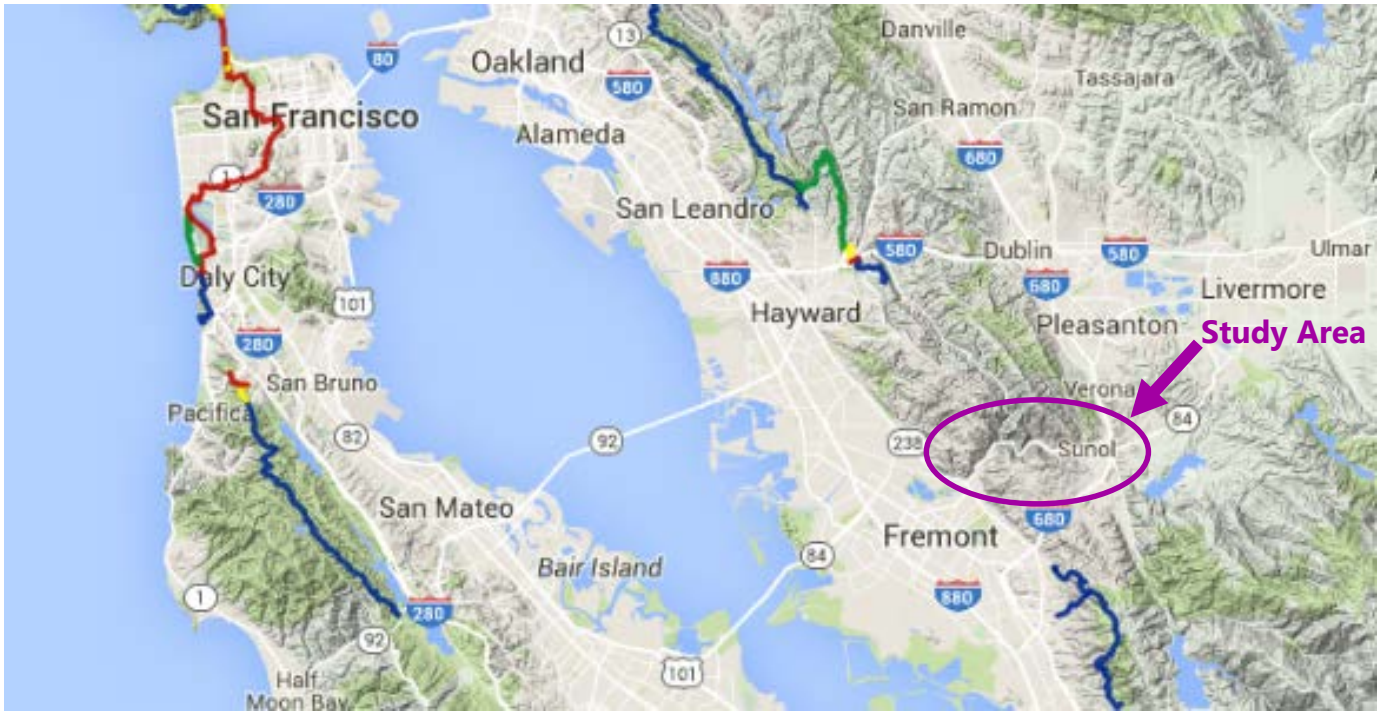


Figure 1 – Study Area

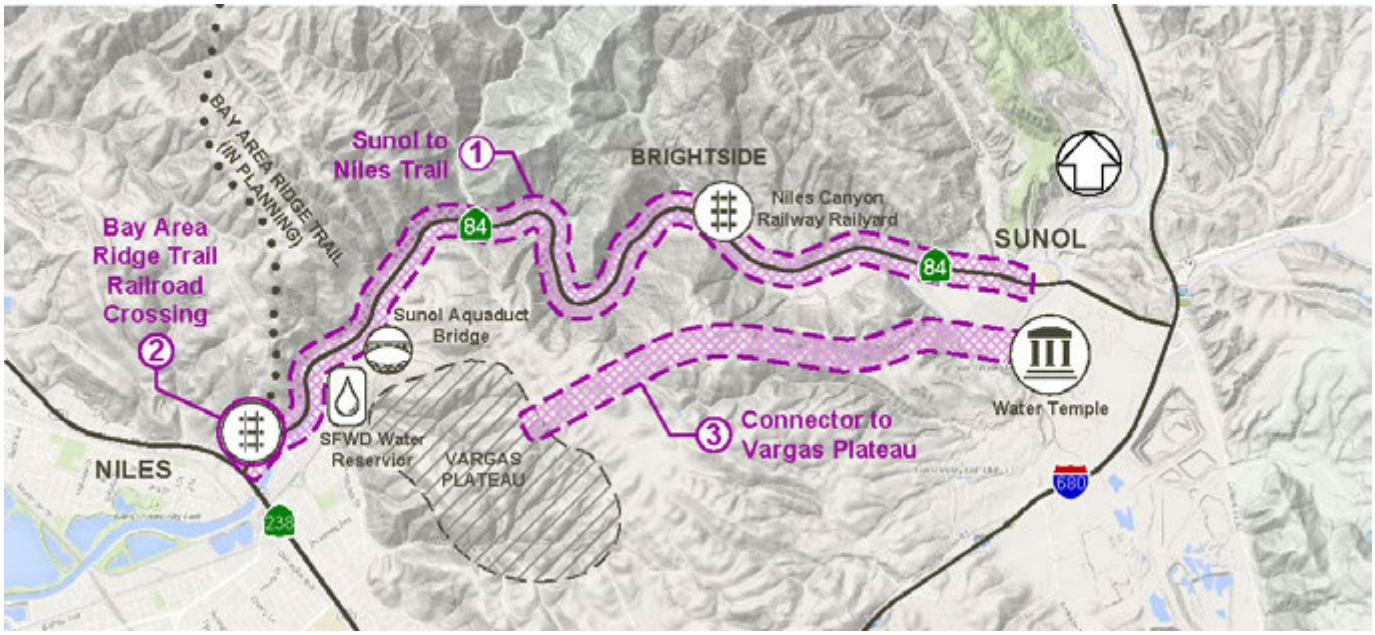


Figure 2 – Trail Segments

OUTREACH

Not only is there general public interest in Niles Canyon, but there are several agencies that own property and manage resources within the Canyon. In preparation of this report, the team conducted several technical advisory committee (TAC) meetings to review concepts and obtain feedback. The TAC met in July and December 2014 as well as March 2015; members included:

Dawn Argula – Alameda County
Doug Chun – Alameda County Water District (ACWD)
Neal Fujita - San Francisco Public Utilities Commission (SFPUC)
Christopher Miley – Alameda County
Beth Perrill – Alameda County
Carla Schultheis – San Francisco Public Utilities Commission (SFPUC)
Elizabeth White – State of California Department of Transportation (CALTRANS)
Suzanne Wilson – East Bay Regional Park District (EBRPD)

To help the TAC as well as community leaders understand the challenges developing trails within the Canyon, the team completed a field walk in November 2014. The walk began in the westerly segment at the extension of Old Canyon Road where we investigated the Sunol Aqueduct as well as the Niles Canyon Railway corridor. The visit also included a review of the Highway 84 near Dead Cow Curve and near the remains of bridge abutments where Old Canyon Road formerly crossed Alameda Creek.

November 2014 field walk helped participants understand constraints and opportunities in developing a trail within the Canyon.

To obtain feedback regarding trail feasibility study, the team presented concepts to the public at the following meetings:

October 14, 2014 – Community Meeting 1 in Sunol to present the overall goals of the study
January 27, 2015 – Community Meeting 2 in Niles to present potential trail options
April 14, 2015 – Fremont City Council Meeting to present the overall goals and potential options
May 12, 2015 – Union City Council Meeting to present overall goals and potential options
June 18, 2015 – Community Meeting 3 in Niles to present recommended options and next steps

On October 11, 2015, the team attended the Niles Canyon Stroll and Roll event to discuss and receive comment on the multi-use trail. The event was a unique opportunity as CALTRANS closed State Route 84 to vehicle traffic allowing community members to walk or bicycle through Canyon. Team members setup stations at Palomares Road and Brightside to discuss trail options with over 400 community members.

Through this process, we heard the following comments from the community and stakeholders:

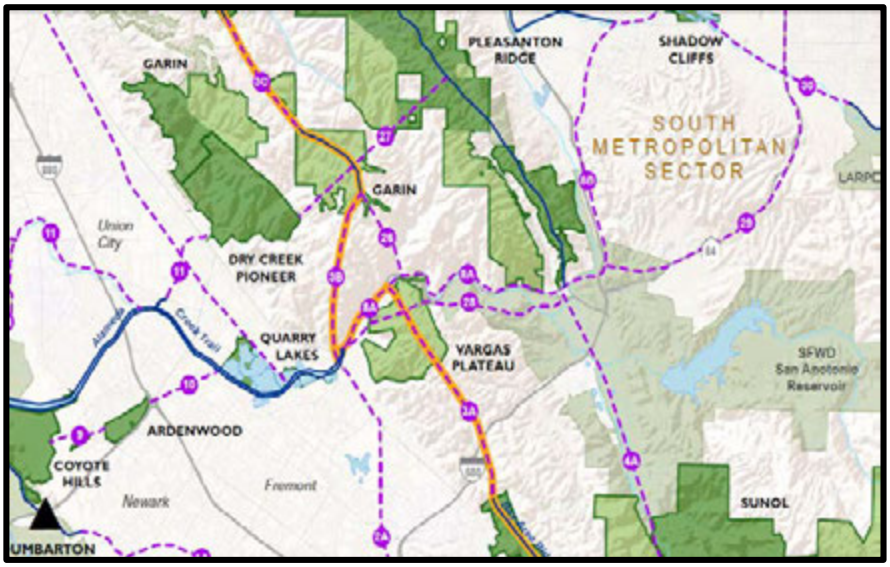
- Develop a trail that serves equestrians, bicyclists, strollers, and pedestrians equally.
- In developing the trail, address safety issues such as rockslides and emergency vehicle access.
- Promote connections to Alameda Creek and Palomares Road.
- Tell the history of the Canyon.
- Provide train stops for the Niles Canyon Railway along the way.
- Provide adequate parking with restrooms at staging areas to prevent impact to neighborhoods.
- Limit walls and pavement to maintain a natural feel in the Canyon.
- There is a tradeoff between the north and south side of the Canyon with the former being sunny and latter is shaded.
- Close Highway 84 for a day annually to allow for a walk through the Canyon.

The October 11, 2015 Niles Canyon Stroll and Roll event was extremely popular. East Bay Regional Parks District setup two information stations along Highway 84 to receive feedback regarding expanding trail options in Niles Canyon.

CONSISTENCY WITH REGIONAL PLANS

Local governing agencies support the development of facilities to support non-motorized uses within Niles Canyon Trail including:

- The East Bay Regional Park District's 2013 Master plan identifies trail segment 8A as a linkage from Niles to Sunol. It further integrates segment 3A to connect to the Vargas Plateau and 3B linking Vallejo Mills the Bay Area Ridge trail.
- The 2012 Alameda Countywide Bicycle Plan identifies Highway 84 as a bicycle route. The plan notes that, "Alameda County is a community that inspires people of all ages and abilities to bicycle for everyday transportation, recreation and health, with an extensive network of safe, convenient and interconnected facilities linked to transit and other major destinations."
- The 2012 City of Fremont Bicycle Master Plan identifies Highway 84 as a bicycle route. The plan further notes that, "Niles Canyon Road is an important route for recreational bicycling."



A map from the EBRPD's master plan identifies a trail segment through Niles Canyon.

HISTORY

The first known human settlers within Niles Canyon were the Ohlone people; researchers theorize Native Americans used the Canyon as a corridor between the Bay and inland valleys. While the first documented contact between the Ohlone and Europeans occurred in 1769, it was not until 1797 that colonists established Mission San Jose about five miles southeast and Niles Canyon became part of Mission lands.

In 1835, the Mission Period ended and the Canyon became part of a land grant to Jose de Jesus Vallejo of Rancho Arroyo de la Alameda who constructed a trail linking Livermore Rancho and the Mission San Jose. Two years later, Vallejo constructed an ox driven mill at the western mouth of Niles Canyon, which he replaced in 1841 with a grain and gristmill powered by a waterwheel from water diverted from Alameda Creek in an aqueduct.

At the time of California's statehood in 1850, there were only two counties in the East Bay, Contra Costa and Santa Clara with the boundary described as the center of Alameda Creek. Given the land area and disparate population density, planners formed Alameda County in 1853. During this period, the Vallejo mill prospered becoming one of the most efficient in the region. Vallejo encouraged settlement and farming within the region currently known as Niles. In late 1856, Vallejo constructed a new mill, but the investment was too great and he lost much of the property.

Historic steam engine of the Niles Canyon Railway operates along the original transcontinental rail alignment.

In 1864, the Western Pacific Railroad contracted with Cox and Meyers to construct a rail line through Niles Canyon to connect with other lines serving the Livermore and San Joaquin Valleys bringing farm produce directly to the Bay Area. Alameda County condemned land for the railroad's right of way and construction began. Central Pacific Railroad, who was constructing a portion of the transcontinental railroad from Sacramento east, recognized the need for direct access to San Francisco and purchased the right of way from the Western Pacific. After improving the rail line constructed by the Western Pacific Railroad, the Central Pacific Railroad opened the railroad through Niles Canyon by 1869 along the alignment shown in Figure 3.

In coordination with the rail construction, Alameda County constructed a, "wagon road" through Niles Canyon to support agriculture development at Dresser and Brightside. As a dirt road, it was often impassible in wet weather. By 1928, the State of California assumed operation of the road and it became known as State Route 84. The state paved the road, built three bridges, and constructed retaining walls along the creek. In the west section of the Canyon, the road's original alignment was on the south side of Alameda Creek until 1958 when the State constructed its current configuration as shown in Figure 4. Sections of the original roadway remain today.

In the early 1870's the Spring Valley Water Company, recognized that its Peninsula water supply was inadequate to serve growing potable water demand of San Francisco and began buying water rights in Sunol and Niles Valleys. They constructed a concrete aqueduct through the Canyon commencing near the Sunol Water Temple and ending at a reservoir near the Canyon's western extent. The San Francisco Water Department took possession of the aqueduct in the early 1920's and operated it until 1995. Locals now know the aqueduct as the "secret sidewalk." Figure 5 illustrates the alignment of the aqueduct.

Remnants of the original telegraph lines exist within Niles Canyon

The Southern Pacific (SP) purchased the rail corridor from the Central Pacific in 1869. The SP completed bridges crossing Alameda Creek at Farwell and Dresser in 1896 and 1906 respectively; these bridges remain today. Through the Canyon, SP established three low speed track sections to the mainline at Dresser, Farewell, and Brightside as well as a depot at Brightside. In addition to freight, the Southern Pacific operated two 15-car trains leaving from stations in Oakland and San Francisco bringing about 6,000 visitors to the Canyon between 1878 and 1971. The picnic area near the Farwell stop was the largest and most successful, which operated until 1956. SP operated the line until 1984, when it ceased operation in the Canyon, removed the tracks, and dedicated the land to Alameda County. In 1987, the Pacific Locomotive Associate leased the property from Alameda County and began reconstructing the tracks to operate the Niles Canyon Railway as a railroad history museum.

In 1909, the Western Pacific Railroad began construction of a line parallel to SP on the south side of the Canyon, which required construction of two tunnels of almost a mile in length. In 1984, Union Pacific (UP) bought the line, which it currently uses for freight traffic as well as leases capacity to the Altamont Commuter Express who offers passenger service between the Central Valley and South Bay. Figure 6 illustrates the alignment of the UP railway.

Niles Canyon is the setting for several films produced in the early 20th century. In 1912, George Spoor and Gilbert "Bronco Bill" Anderson established the Essanay Film Company in Niles. While many of the films were western themed, in 1915, Essanay hired Charlie Chaplin, a popular comedic actor of the time. Chaplin shot the movie, "The Tramp" in the canyon using various locations including the hobo camp at Farwell.

Figure 3 Niles Canyon Railway

Official California State Route:
1935
Number of bridges:
2
Number of under crossings:
2

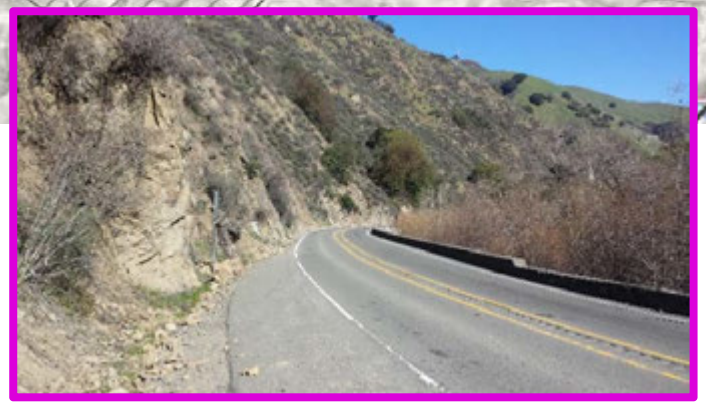


Figure 4 State Route 84

Constructed:
1923
Length above ground:
1.9 miles
Length below ground:
5.6 miles

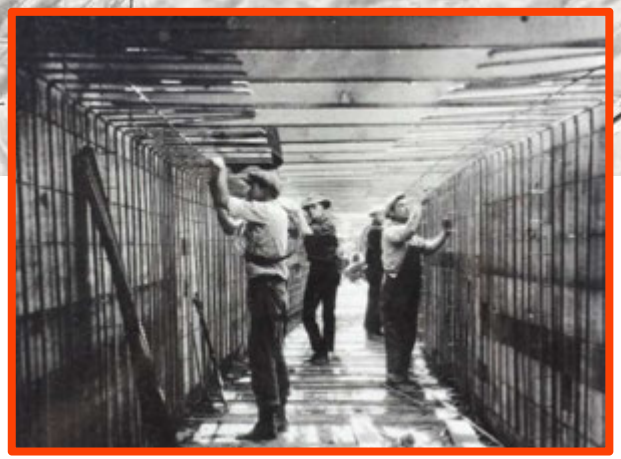


Figure 5 Sunol Aqueduct

Figure 6 Union Pacific Rail Right of Way

GEOLOGY

Alameda County is located at the northern end of the Diablo Range of Central California, with Niles Canyon located within the Coast Range Geomorphic Province of Central California. Sedimentary rocks of the Upper Cretaceous Panoche Formation characterize the Canyon, which is part of a thick sequence of the Great Valley Sequence. Quaternary surficial deposits overlay Panoche Formation rocks in and adjacent to the present-day channel of Alameda Creek.

The walls of Niles Canyon expose the Panoche Formation as well-bedded and composed predominately of micaceous shale, with minor interbedded sandstone and local conglomerates. The Formation's fold axes and faults strike parallel to the bedding in a northwest direction. **Figure 7** illustrates general geologic conditions within the Canyon.

Alameda Creek carved the canyon prior to the uplift of the Diablo Range. The uplift was slow enough and the creek had enough downward erosive strength to maintain its mature meanders through the rising range. This action is responsible for the deeply incised and steep canyon walls that rise approximately 800 to 1,300 feet on both sides of the creek. Over the course of millions of years, Alameda Creek deposit clay, silt, sand, and gravel known as native alluvium throughout the Canyon.

From discussion with residents, CALTRANS, and Pacific Locomotive Association, we understand that the entire Niles Canyon corridor is notorious for rockslides and landslides, which often activate during rainfall or seismic events. There are three active faults known near the Canyon including Calaveras, Pleasanton, and Hayward.

Localized rockslides are common within the steeper sections of the Canyon; here rocks fell atop the Sunol Aqueduct east of the Farwell Bridge

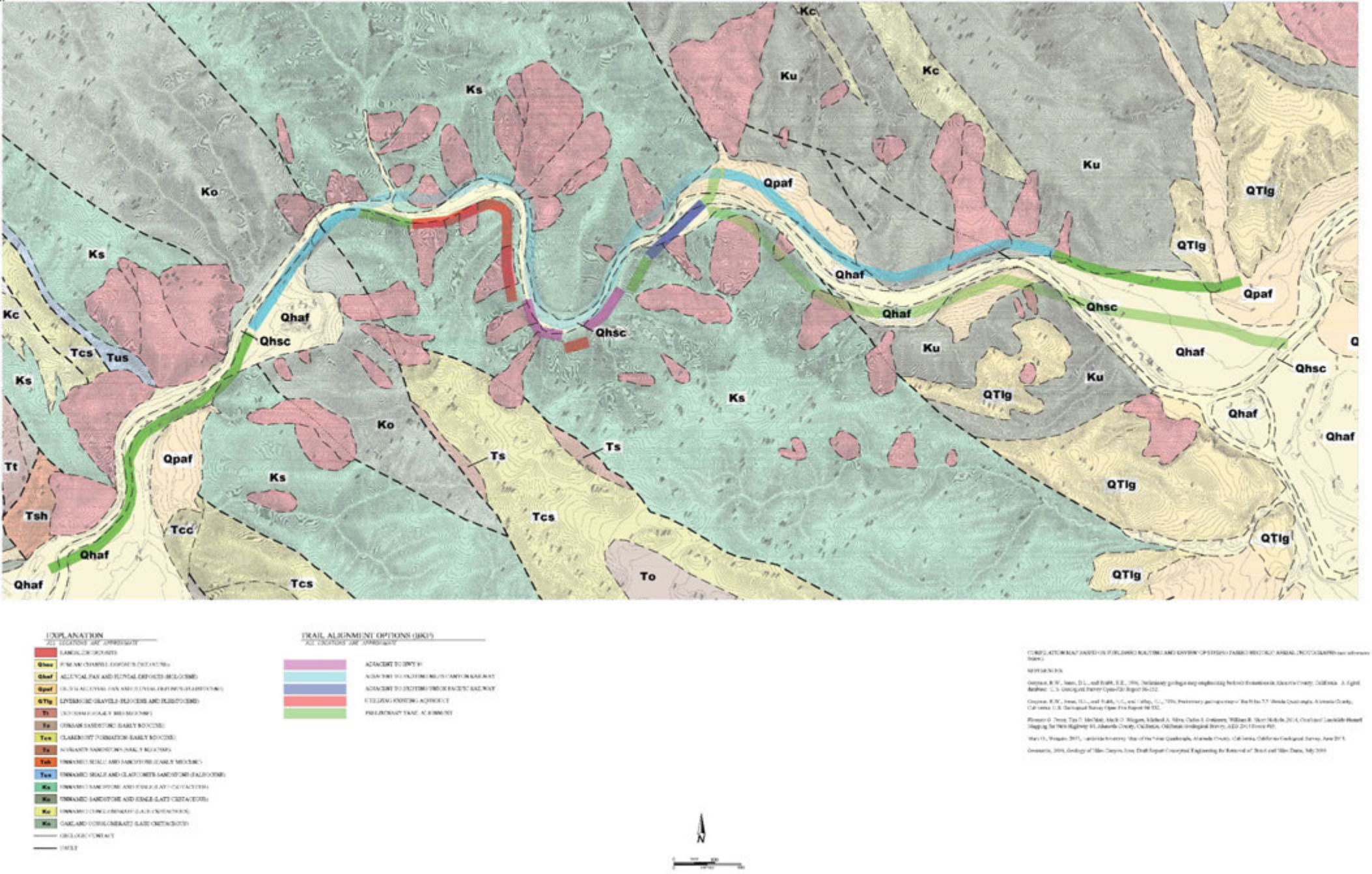


Figure 7 Niles Canyon Geology

BIOLOGICAL RESOURCES

Introduction. To complete a preliminary review of biological resources within Niles Canyon, the consultant team queried the California Natural Diversity Database (CNDDB; CDFW 2014) for species records within a 10-mile radius using Geographic Information Systems (GIS) software (Esri ArcGIS 10.2). Subsequently, a wildlife biologist and botanist/arborist visited select locations within the study area on December 12, 2014 and on February 18, 2015 to identify site-specific biological resources, considerations where trails may cross stream or require significant excavation. Specific area visited on foot include:

(1) The Sunol Water Temple and adjacent riparian woodland next to Alameda Creek;
(2) The original Highway 84 bridge abutment south of Niles Canyon Road across from Brightside;
(3) The Niles Canyon Railway from the Farwell Bridge southwest to Mission Clay;
(4) Vallejo Mill City Park in Fremont'
(5) The first 800 feet of the former Mission Clay access road at the end of Old Canyon Road.

Existing Conditions. Land cover types found along the proposed trail alignment include mixed evergreen forest/oak woodland, mixed riparian forest/woodland, sycamore alluvial woodland, and scattered stands of northern coastal scrub/Diablan sage scrub.

Mixed evergreen forest/oak woodland is found along much of the proposed trail alignment and is dominated by coast live oak (*Quercus agrifolia*) and California bay (*Umbellularia californica*). Plants in the understory include variety of ferns such as California maidenhair (*Adiantum jordanii*), California wood fern (*Dryopteris arguta*), goldenback fern (*Pentagramma triangularis*), and California polypody (*Polypodium californicum*).

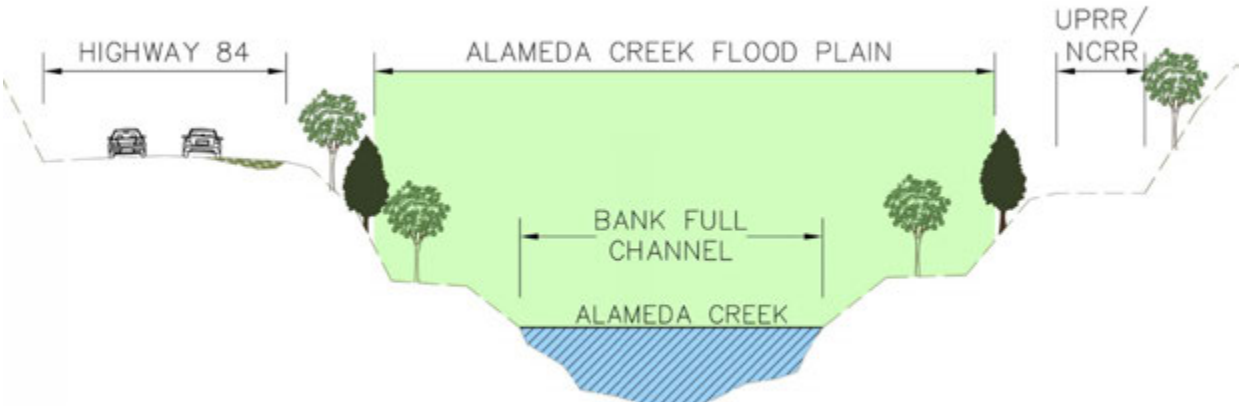
Mixed riparian forest/woodland is found within the floodplain of Alameda Creek and is characterized by coast live oak, California bay, big leaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), Fremont cottonwood (*Populus fremontii*), and red willow (*Salix laevigata*). Plants in the understory include Himalayan blackberry (*Rubus armeniacus*) and California blackberry (*Rubus ursinus*).

Sycamore alluvial woodland is found at the eastern end of the proposed alignment and is dominated by an overstory of large western sycamore (*Platanus racemosa*). Subdominant tree species include California buckeye (*Aesculus californica*), California black walnut (*Juglans hindsii*), coast live oak, California bay, valley oak (*Quercus lobata*), and arroyo willow (*Salix lasiolepis*). Plants in the understory include coyote brush (*Baccharis pilularis*), American dogwood (*Cornus sericea*), California blackberry, and black elderberry (*Sambucus nigra*).

Northern coastal scrub/Diablan sage scrub occurs in scattered locations along the proposed trail alignment, principally along the railroad right-of-way. The dominant species in this habitat are primarily shrub species and include California sagebrush (*Artemisia californica*), coyote brush, golden yarrow (*Eriophyllum confertiflorum*), sticky monkey flower (*Mimulus aurantiacus*), and poison oak (*Toxicodendron diversilobum*).

Jurisdictional Waters. Alameda Creek as shown in Figure 8 and tributaries are subject to U.S. Army Corps of Engineers (Corps) and San Francisco Bay Regional Water Quality Control Board (RWQCB) jurisdiction under Sections 404 and 401 of the Clean Water Act (CWA) and the Porter-Cologne Act, respectively. The creek, tributaries, and associated riparian communities also fall under the jurisdiction of the California Department of Fish and Wildlife (CDFW) under Section 1602 of the California Fish and Wildlife Code. The

team did not observe any seasonal wetlands/depressions, ditches, ponds, or other features potentially subject to Corps, RWQCB, or CDFW jurisdiction.



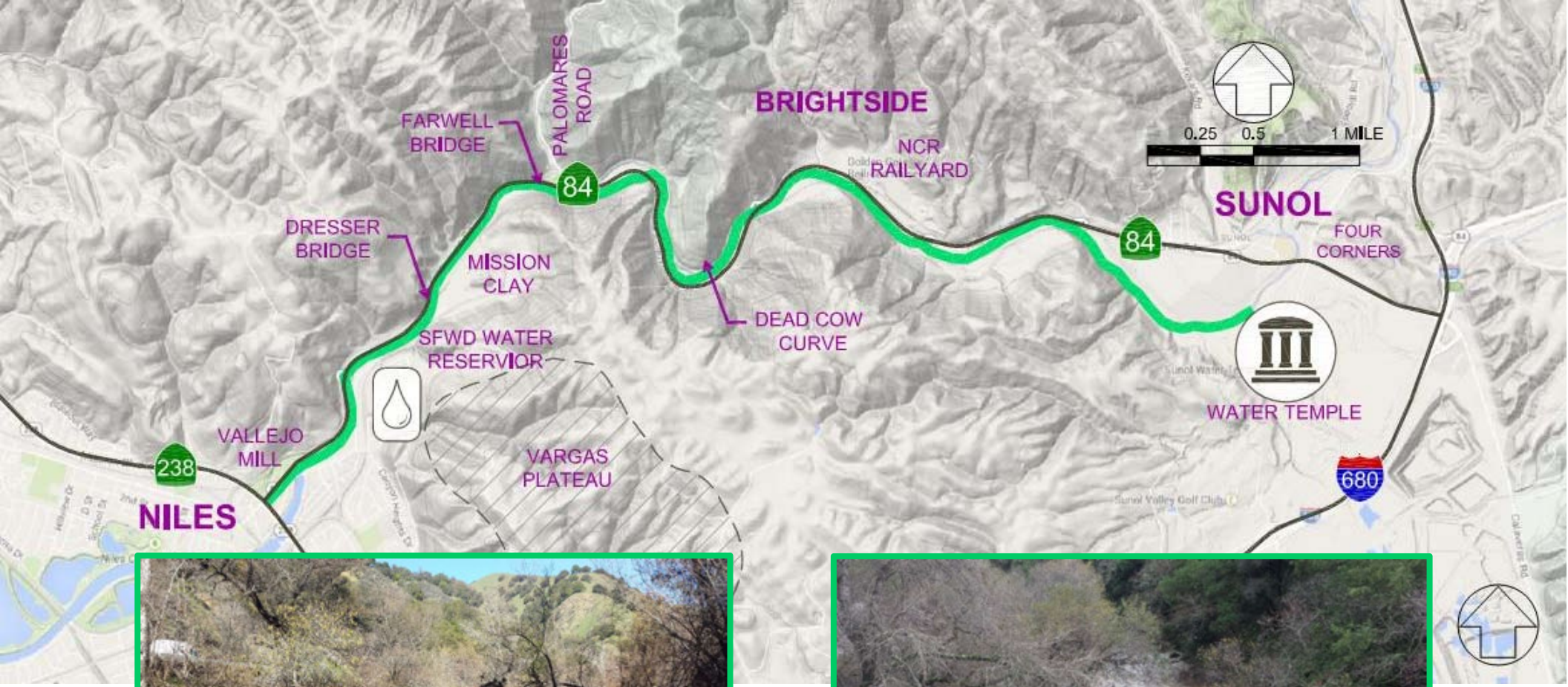
Alameda Creek's flood plain extends beyond the apparent channel and likely under the jurisdiction of State regulatory agencies.

Special-Status Species. The project vicinity includes habitat for the following special-status plant and animal species:

- Chaparral harebell (*Campanula exigua*). Chaparral harebell is generally found on rocky sites within chaparral habitats and is often associated with serpentine soils. Chaparral harebell has a California Rare Plant Rank of 1B.2 (rare, threatened, or endangered in California and elsewhere). This species is known to occur in close proximity to the proposed trail alignment in the Sunol Valley.
- Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*). Congdon's tarplant is found in grazed and ungrazed annual grassland and is often associated with alkaline or saline soils. Congdon's tarplant has a California Rare Plant Rank of 1B.1. This species is known to occur in the project vicinity and may occur within the project boundaries if there are areas of mesic grassland along the proposed trail alignment.
- Santa Clara Red Ribbons (*Clarkia concinna* ssp. *automixa*). Santa Clara red ribbons occurs in chaparral and woodland habitats. Santa Clara red ribbons has a California Rare Plant Rank of 4.3 (limited distribution). The species is known to occur in close proximity to the proposed trail alignment.
- Steelhead (*Oncorhynchus mykiss*). Steelhead are anadromous fish that spend most of their lives in the Pacific Ocean and return to freshwater streams to spawn. The Central California Coast steelhead population is federally threatened. Central California Coast steelhead are known to occur in the lower reaches of Alameda Creek, but are currently prevented from accessing upper Alameda Creek by the BART Weir and rubber dams downstream of the project site. However, efforts are underway to provide fish ladders over those obstacles in order to allow steelhead to move upstream to spawn. These projects are expected to be completed by 2017.
- California Tiger Salamander (*Ambystoma californiense*). California tiger salamanders occur in grassland, oak woodland, and coastal scrub/chaparral habitats that contain small mammal burrows for dry-season retreats and seasonal ponds and pools for breeding during the rainy season. California tiger salamanders are federally and state threatened. Suitable breeding habitat does not occur along the proposed trail alignment. However, they are known to breed in several seasonal ponds within 1.3 miles of the study area. The CDFW and the United States Fish and ga Service (USFWS) generally consider 1.3 miles to be the normal maximum dispersal distance for this species

from a breeding site. As such, both agencies are likely to consider areas along the proposed trail alignment as movement/dispersal habitat for this species.

- Foothill Yellow-legged Frog (*Rana boylii*). Foothill yellow-legged frogs occur in streams and rivers with rocky substrates and open, sunny banks. Foothill yellow-legged frogs are a California Species of Special Concern and a petition to list this species under the federal Endangered Species Act has been recently accepted. There are no records of yellow-legged frogs in the study area. However, the species is known to occur farther upstream in the upper reaches of Alameda Creek.
- California Red-legged Frog (*Rana draytonii*). California red-legged frogs occur in ponds, streams, drainages, and associated uplands; they require areas of deep, still, and/or slow-moving water for breeding. California red-legged frogs are federally threatened and are a California Species of Special Concern. Red-legged frogs are known to occur in the project vicinity but are unlikely to breed in Alameda Creek due to the presence of bullfrogs and predatory fish. The creek and adjacent riparian and woodland habitats do provide potential foraging and movement habitat for red-legged frogs. Freshwater ponds in the vicinity may support breeding populations.
- Western Pond Turtle (*Actinemys marmorata*). Western pond turtles occur in ponds, streams, drainages, and associated uplands. Western pond turtles are a California Species of Special Concern. Pond turtles are known to occur in Alameda Creek and ponds in the nearby vicinity.
- Alameda Whipsnake (*Masticophis lateralis euryxanthus*). Alameda whipsnakes are found in chaparral and sage scrub with rock outcrops and an abundance of prey species such as western fence lizards (*Sceloporus occidentalis*). Alameda whipsnakes are federally and state threatened. Whipsnakes are known to occur north and south of Highway 84 and may use habitats within the proposed trail alignment as movement corridors.
- Burrowing Owl (*Athene cunicularia*). Burrowing owls are found in open habitats (e.g., grasslands, agricultural areas) with mammal burrows or other features such as culverts, pipes, or debris piles suitable for nesting and roosting. Burrowing owls are a California Species of Special Concern. Suitable habitat is present at Vallejo Mill Park and Sunol Water Temple.
- Tricolored Blackbird (*Agelaius tricolor*). Tricolored blackbirds historically nested in freshwater marshes dominated by cattails and bulrushes, but now commonly nest in areas dominated by blackberries, mustards, thistles, or mallows. Large colonies also occur in grain fields in the Central Valley. Tricolored blackbirds are a California Species of Special Concern and have been known to nest in the project vicinity, at the junction of Alameda Creek and Highway 680.
- San Francisco Dusky-footed Woodrat (*Neotoma fuscipes annectens*). Woodrats occur in forested habitats with moderate canopy and moderate to dense understory. San Francisco dusky-footed woodrats are a California Species of Special Concern. No nests were observed during the reconnaissance surveys, but suitable habitat is present along most of the proposed trail alignment.
- Roosting Bats. Several special-status bat species, including Townsend's big-eared bat, (Corynorhinus townsendii), may occur in the project area. Potential bat roosting habitat includes caves, mines, human structures, and hollows in large trees. Some bat species also nest in foliage or under loose bark. The team did not see potential roosting habitat or evidence of roosting bats during survey of the site.



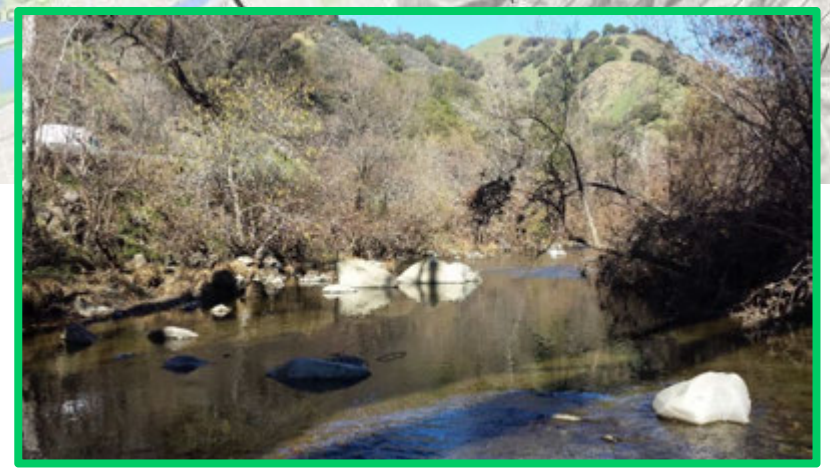


Figure 8 Alameda Creek

CULTURAL RESOURCES

Introduction. To complete a preliminary review of cultural resources within Niles Canyon, the team conducted a records search of the study area on December 15, 2014, at the Northwest Information Center (NWIC) of the California Historical Resources Information System, Sonoma State University, Rohnert Park. The NWIC, an affiliate of the State of California Office of Historic Preservation, is the official State repository of cultural resource records and reports for Alameda County. As part of the records search, the team also reviewed the following State inventories for cultural resources in and adjacent to the study area:

- *California Inventory of Historic Resources* (California Department of Parks and Recreation 1976);
- *Five Views: An Ethnic Historic Site Survey for California* (California Office of Historic Preservation 1988);
- *California Points of Historical Interest* (California Office of Historic Preservation 1992);
- *California Historical Landmarks* (California Office of Historic Preservation 1996);
- *Directory of Properties in the Historic Property Data File* (California Office of Historic Preservation April 5, 2012). The directory includes the listings of the National Register of Historic Places (NRHP), National Historic Landmarks, and the California Register of Historical Resources (CRHR); and
- *Caltrans Historic Bridge Inventory* (California Department of Transportation July 2015).

Existing Conditions. The record search found that previous groups completed 37 studies within the Canyon that found ten cultural resources. Of the resources found, five are archaeological sites and 14 are built-environment resources. Of the build-environment resources, ten are eligible for listing on the NRHP and the CRHR. One built-environment resource is P-01-011357, the NRHP-listed Niles Canyon Transcontinental Railroad Historic District and another is the California Historic Landmark #46, CA-ALA-548H/P-01-000227, the Vallejo Flour Mill.

Field Investigation. A registered professional archaeologist conducted a limited field review of the study area on December 17, 2014 to identify site-specific cultural constraints where the trail construction may create ground disturbance. This was not a formal cultural resources pedestrian survey. Specific areas investigated included:

- The Sunol Water Temple and adjacent riparian woodland next to Alameda Creek
- Vallejo Mill City Park in Fremont
- The Niles Canyon Railway from the historic Farwell Bridge southwest to Mission Clay
- The original Highway 84 bridge abutment south of Niles Canyon Road across from Brightside
- The first 800 feet of the former Mission Clay access road at the end of Old Canyon Road.

We also completed a focused geoarchaeological assessment for field review areas to assess the sensitivity for buried archaeological resources. Generally, Holocene-age (11,500 cal. B.P. to present) landforms have a potential for containing buried prehistoric archaeological deposits as these contain surfaces that were available for occupation and use during prehistory. Holocene-age landforms in the vicinity of a natural water source such as Alameda Creek have an elevated sensitivity for buried archaeological deposits (Rosenthal et al. 2003:72-76)

Findings. The following summarizes the results of the field review and geoarchaeological sensitivity assessment.

Sunol Water Temple. The proposed creek crossing is located adjacent to riparian woodlands near the confluence of Alameda Creek and Arroyo de la Laguna creeks. According to the California Department of Conservation (CDC) 2010 Geologica Map of California, the area consists of Holocene - age alluvium deposits (Qhaf). We observed no archaeological deposits at this location; however, the records search identified CA-ALA-565H/P-01-000015, a prehistoric and historic-period archaeological site, near the proposed creek crossing.

The proximity to watercourses, Holocene-age landforms, and the presence of a previously recorded resource suggests ground disturbance at this location and in the vicinity has a high potential to encounter archaeological deposits, including subsurface archaeological remains, during construction (Luby 1993).

Vallejo Mill City Park. This proposed crossing area is within Vallejo Mill City Park in Fremont. The park lies along a terrace of Alameda Creek and consists of grasslands and a few oaks. Geologically, the area consists of older Holocene alluvium deposits (Qhaf) (CDC 2010). The records search identified CA-ALA-548H/ P-01-000227, a prehistoric and historic-period archaeological site that includes exposed foundations of an 1856 mill, within the proposed crossing area (Baker 1990). The exposed foundations of the mill are listed as California Historical Landmark #46.

Exposed foundation of the 1856 mill located near the Mission Boulevard.

Based on the Holocene-age landforms, proximity to Alameda Creek, and the confirmed and recorded archaeological site, ground disturbance at this location and in the vicinity has a high potential to encounter archaeological deposits, including the exposed mill remains and potential subsurface archaeological remains, during construction.

Farwell Bridge Southwest to Mission Clay. This portion of the study area is along Alameda Creek and parallel to the Niles Canyon Transcontinental Railroad Historic District tracks. Geologically, this area consists of older Pleistocene–age alluvium deposits (Qpaf) and younger Holocene-age deposits (Qhaf) (CDC2010). The records search identified two previously recorded built-environment resources at this location, consisting of: (1) P-01-008189/Caltrans Bridge # 33-0035, Farwell Bridge, a railroad bridge constructed in 1932; and (2) P-01-011357, the Niles Canyon Transcontinental Railroad Historic District, a historic district listed in the NRHP and CRHR (Scantlebury 2004a; 2004b).

The geological deposits in this study area range in age from the older, Pleistocene deposits to

younger Holocene-age, which are archaeologically sensitive. It is likely that the area is generally sensitive for buried archaeological deposits.

Original Highway 84 Bridge Abutment. This portion of the study area lies south of Niles Canyon Road across from the unincorporated community of Brightside. Geologically, the area consists of older Holocene alluvium deposits (Qhaf).The records search identified P-01-010797, a concrete bridge abutment, on the north side of Alameda Creek (Larson 2005). Grasses and pavement obscured our ability to review the surface.

Based on the Holocene-age landforms and proximity to Alameda Creek, ground disturbance at this location and in the vicinity has a high potential to encounter archaeological deposits,

Mission Clay Access Road. Given the Holocene- age landforms and proximity to Alameda Creek, ground disturbance within the first 800 feet of the former Mission Clay access road has a high potential to encounter archaeological deposits.

Recommendations. Based on the results of the records search, geoarchaeological assessment, and the limited field review, the proposed project has the potential to impact cultural resources, including prehistoric and historic-period archaeological sites and built environment resources. The nature and severity of these impacts depend on the status of the resources subject to effect, as well as the type of project action proposed at specific locations. Should any of the actions result in a substantial adverse change to the significance of resources that qualify as historical resources under PRC Section 21084.1, then a significant impact to the environment may result. Project activities such as excavation, new construction, and site clearance have the potential to result in direct and indirect impacts to such resources.

Upon refining, the trail alignment, in accordance with applicable state and federal laws, qualified personnel who meet the appropriate Secretary of the Interior's Professional Qualifications Standards should conduct additional literature reviews and survey the proposed project corridor to identify project-specific impacts to cultural resources.

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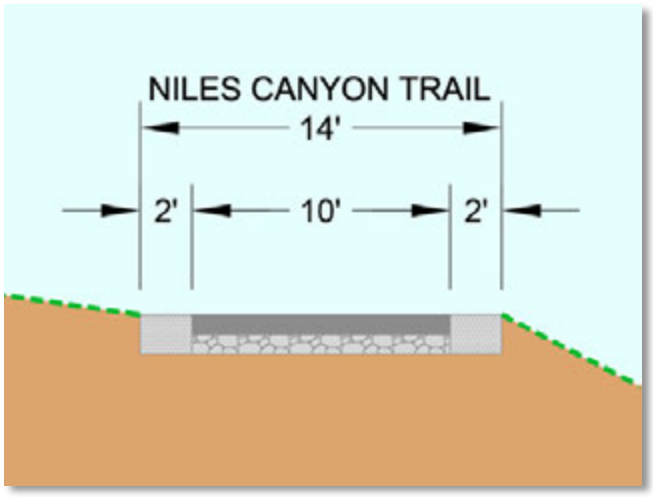
SEGMENT 1 – NILES TO SUNOL MULTI USE TRAIL

Introduction. Accessing Niles Canyon is difficult for pedestrians and bicyclists given steep topography, dense vegetation, and private property. While both the right of way of Niles Canyon and Union Pacific Railroads are physically accessible to hikers, the property owners do not allow access for safety reasons. Highway 84 permits both bicyclist and pedestrians, but limited shoulders, narrow bridges, and high traffic volumes and speeds discourage use. Given these constraints, the Town of Sunol, which has a population of 913 (2010-census) residents essentially, has no non-motorized access to destinations to the west.



Niles Canyon Trail will meet the Department of Transportation's Class 1 Trail Standard; the trail will be both accessible and have all weather access.

The six mile long Niles to Sunol multi use trail will be a Class 1 facility as defined by the California Department of Transportation consisting of an all-weather surface likely of asphalt concrete that is 10 feet in width and will likely consist of 4 inches of asphalt concrete atop 6 inches of class II aggregate base. The trail will have shoulders on each side that are at least two feet wide, composed of decomposed granite. Additionally, the trail will meet accessibility guidelines meaning the grade in the direction of travel will be less than 5% and the cross slope will be no more than 2%.

In developing trail options, the team established the following goals:

1. establish a safe and functional class 1 trail;
2. minimize impacts to environmental resources;
3. enhance or maintain stakeholder access to infrastructure;
4. develop trail alignments with a realistic cost that can be implemented in a reasonable time frame; and
5. identify and preserve the historic water and rail infrastructure within Niles Canyon.

After walking the Canyon from Sunol to Niles several times, the team concluded that given the steep topography present between Vallejo Mill Park and west of Brightside, there is only one feasible trail option located on the south side of the Canyon as shown in Figure 1-1. However, at Brightside, there are options available to locate the trail on either the north or south side of the Canyon.

A third option includes sharing the existing Alameda County right of way with both a trail and the Niles Canyon Railway.

The extension of Old Canyon Road to the Mission Clay property provides the foundation of a class 1 trail in the west section of the Canyon.

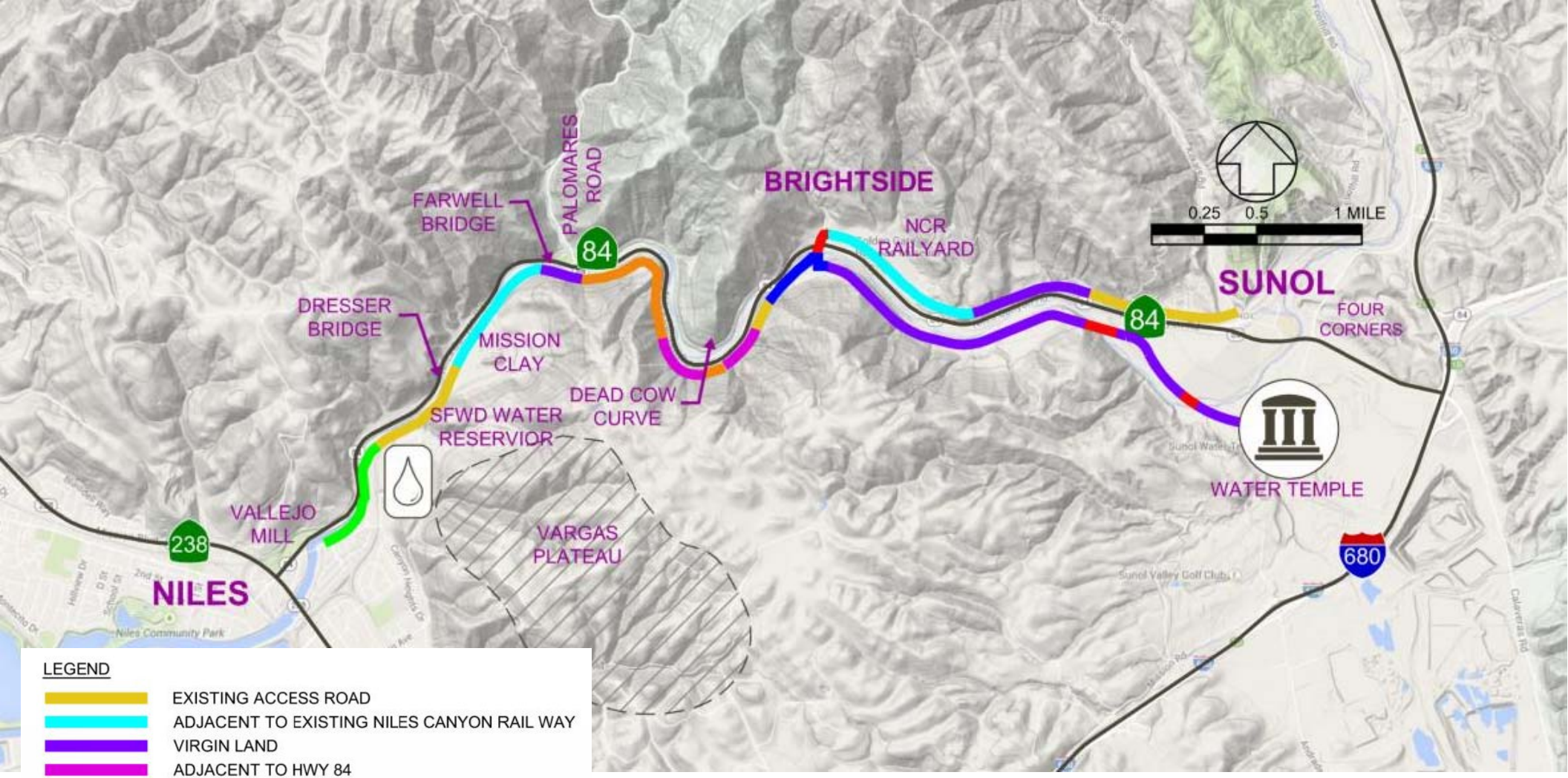
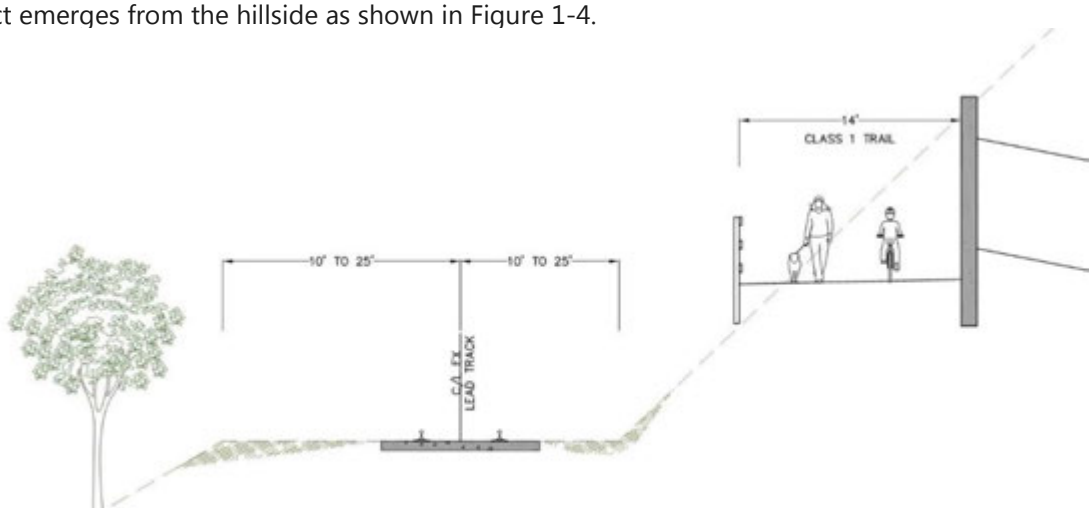


Figure 1-1 - Canyon Trail

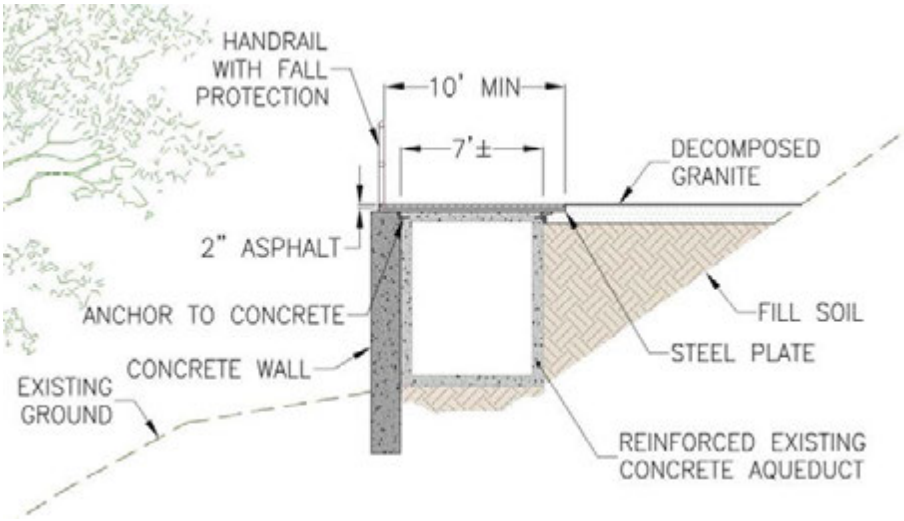
Canyon Trail. The west section of the trail begins as shown in Figure 1-2 at the end of Old Canyon Road, where the SFPUC has a gate and maintains a service road that leads to the Mission Clay property. While this roadway will require re-surfacing, installation of retaining walls, and fencing, there is sufficient width to construct a trail.

As a private group owns the former Mission Clay property, the trail will need to shift from the service road to parallel the Niles Canyon Railway within the Alameda County right of way as shown in Figure 1-3. To maintain safety, the project will vertically separate the trail from the railroad's operations. This will include a fence allowing for wildlife passage. To construct the trail along the steep slope near the Farwell Bridge, the project will need to grade and install retaining walls. However, east of the Farwell Bridge, the Sunol Aqueduct emerges from the hillside as shown in Figure 1-4.



The trail located adjacent to but vertically separated from the Niles Canyon Railway west of the Farwell Bridge.

The aqueduct makes an excellent path for pedestrian traffic; it is level and in amazingly good condition for being almost 100 years old. To make it safe for trail users, the project will need to reinforce and widen it including adding fall protection. Given the steep topography and need to accommodate equestrian users, we recommend including widened areas where possible.



The project will need to reinforce and widen the aqueduct for use as a trail.

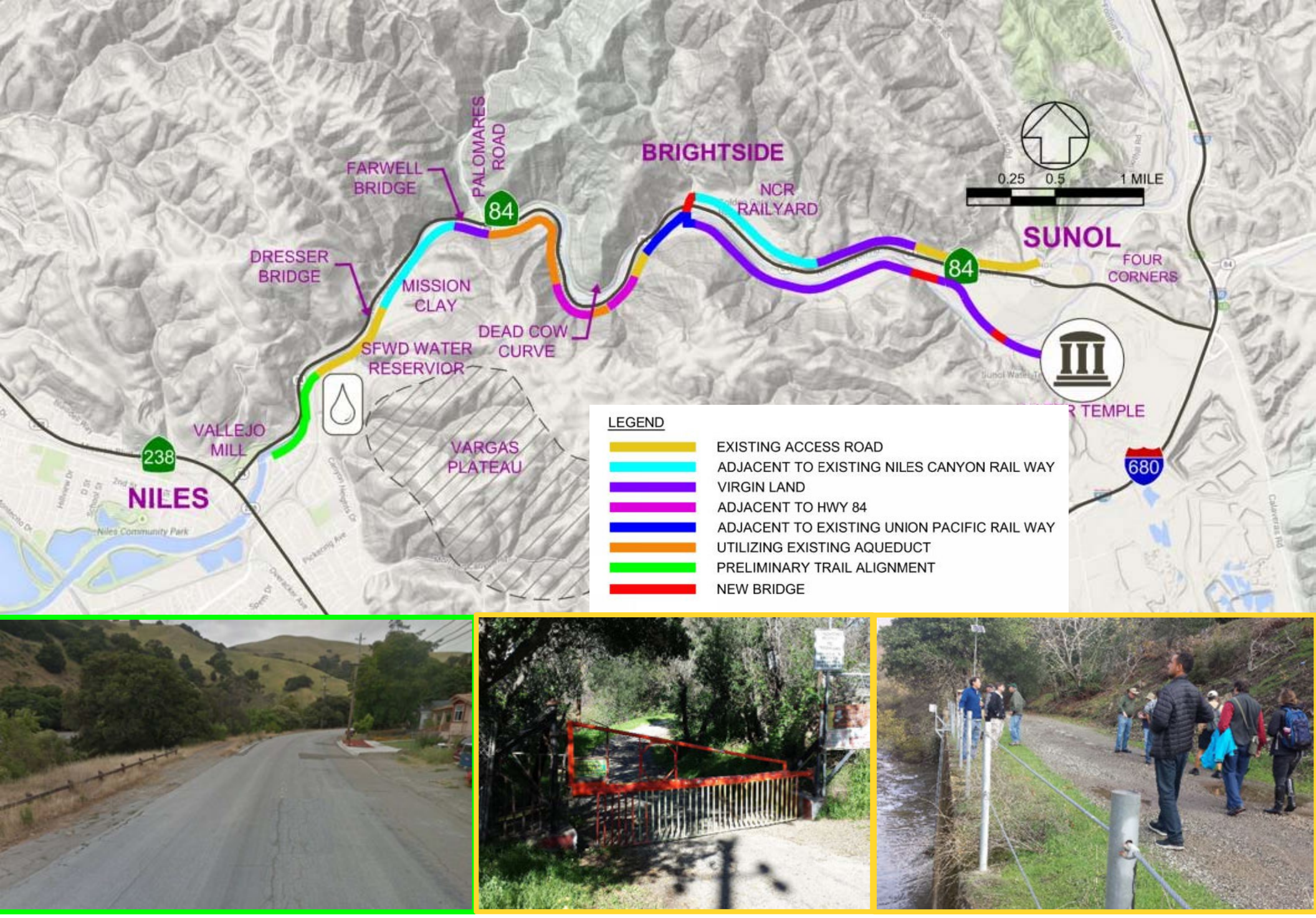


Figure 1-2 - Canyon Trail to Mission Clay Property

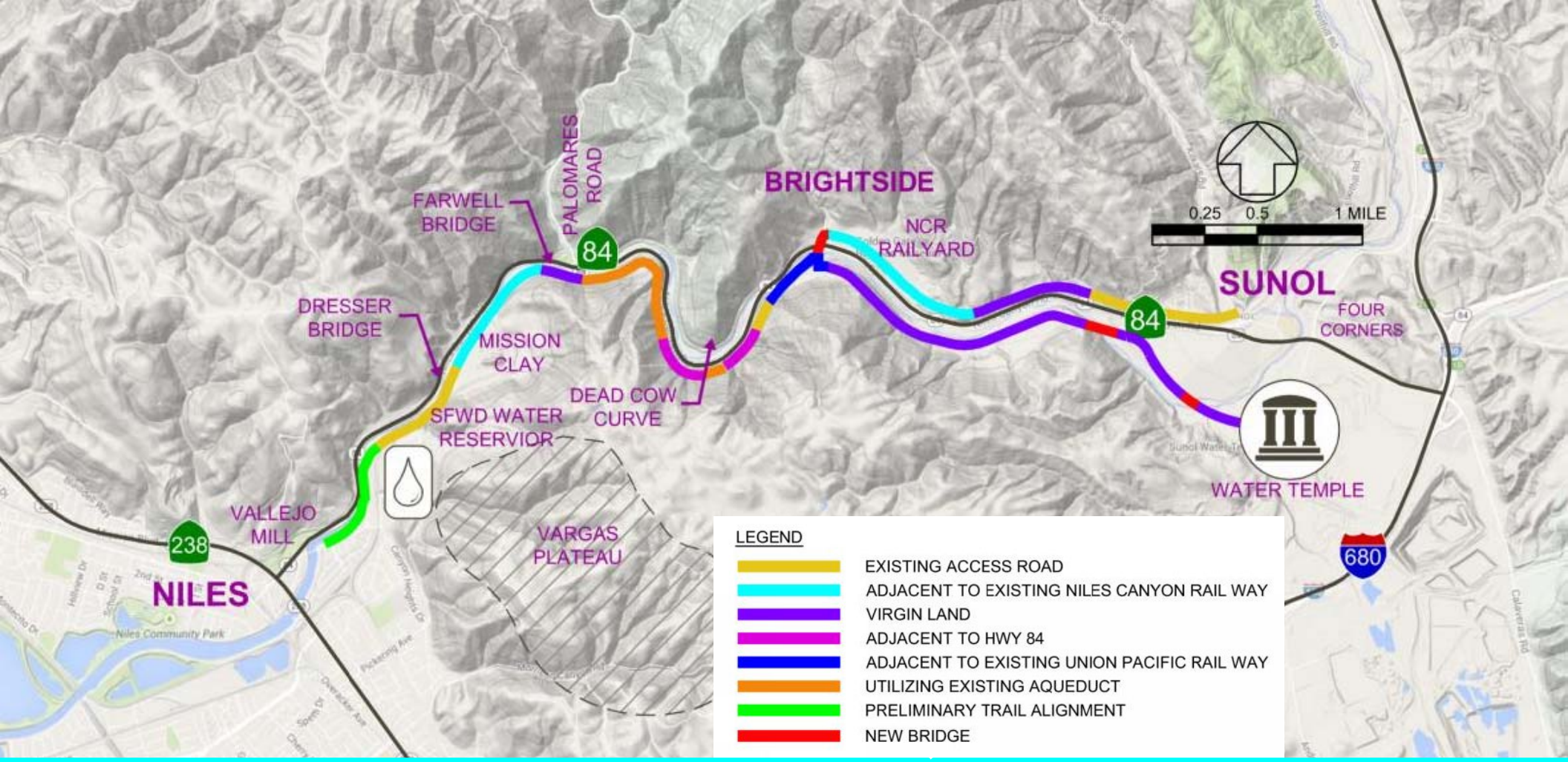
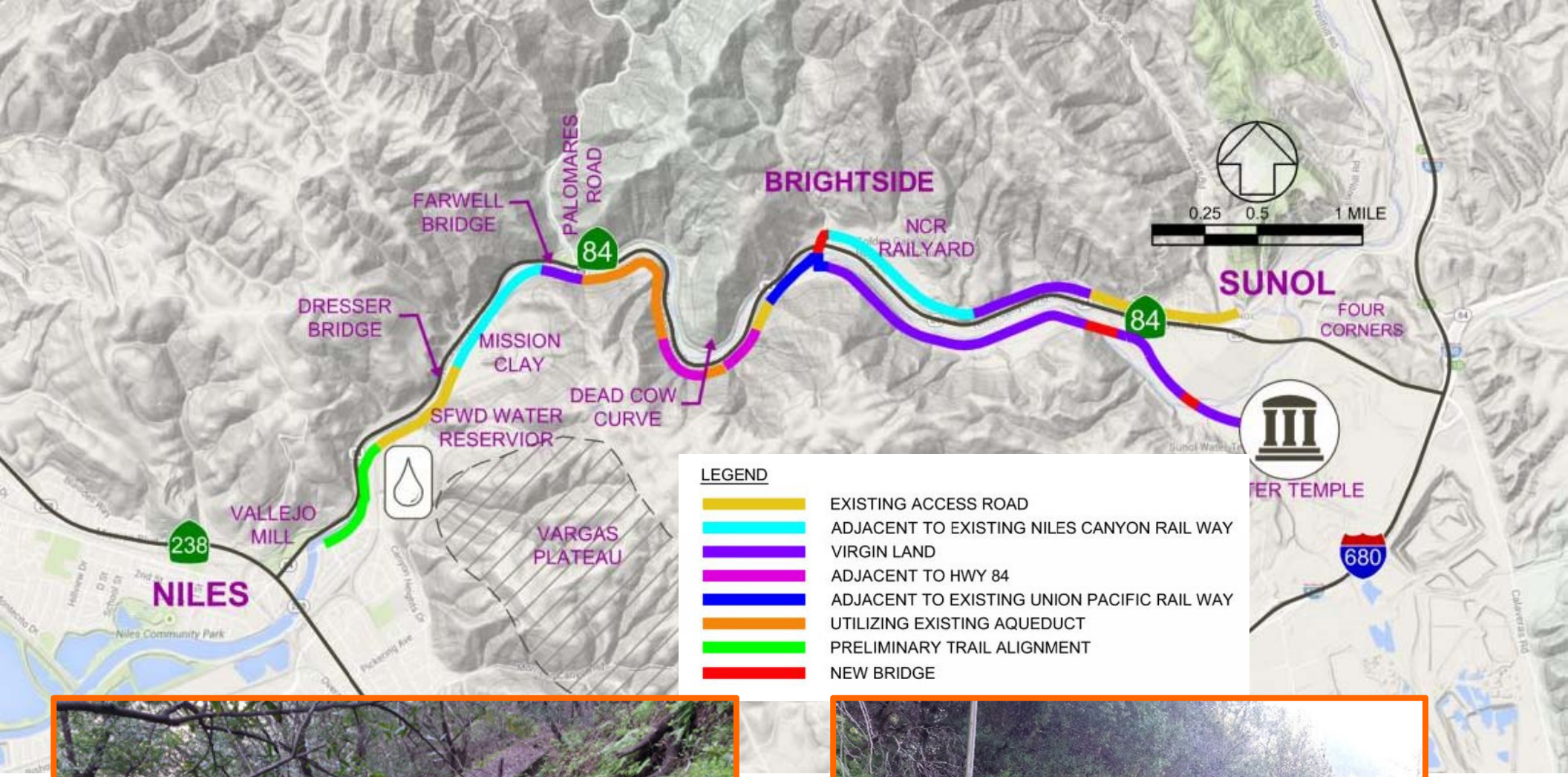
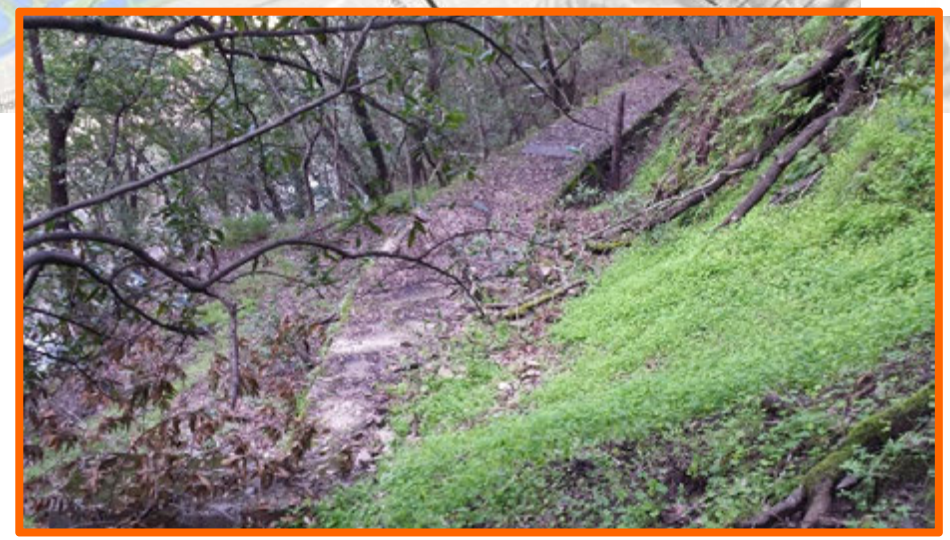


Figure 1-3 - Canyon Trail to Farwell Bridge





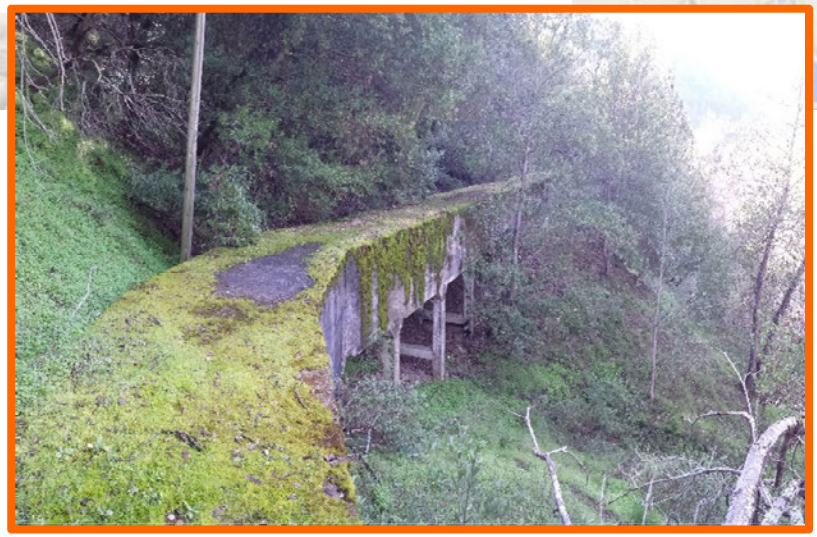
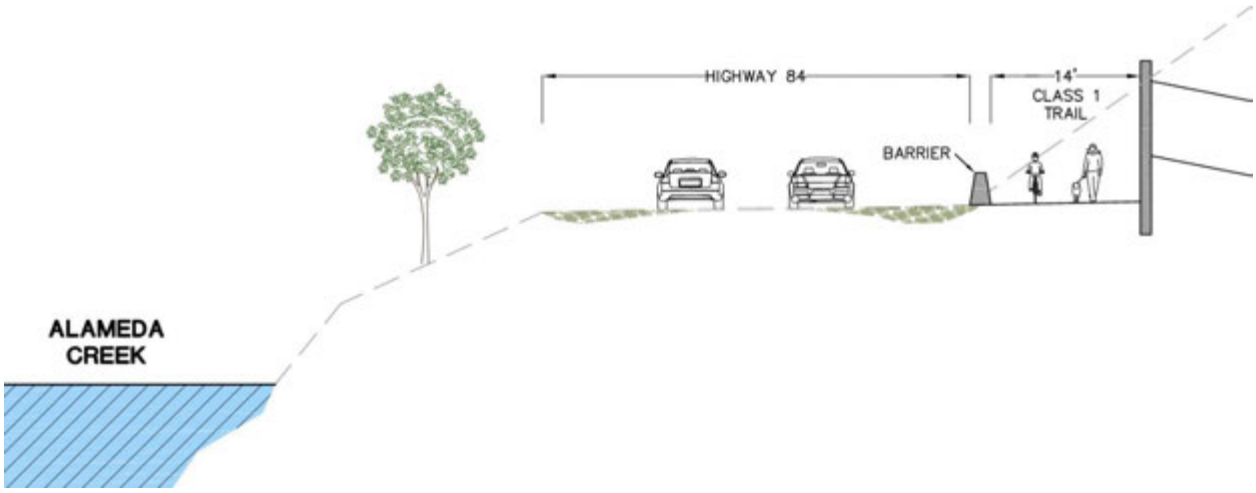


Figure 1-4 - Canyon Trail along Sunol Aqueduct

The aqueduct gradually merges and is level with the elevation of Highway 84 at Dead Cow curve as shown in Figure 1-4. The project will need to install a barrier, grade the existing slope, and potentially add a wall to provide the width necessary for a Class 1 trail. However, as we understand that CALTRANS is studying options to improve safety at this curve, we recommend reserving area for the trail in any future improvements within this area.



At Dead Cow curve, the trail will be adjacent to the Highway 84 requiring a barrier.

Just to the east of Dead Cow curve, the trail will use a remnant of the Old Highway 84, which is currently an access road used by Union Pacific Railroad. As shown in Figure 1-6, this roadway is in good condition requiring only maintenance for re-use as a trail. At this location, there is an option to locate the trail as it travels to Sunol on either the north or south side of the Canyon. The need to cross railroad right of way, Highway 84, and Alameda Creek complicate the options.

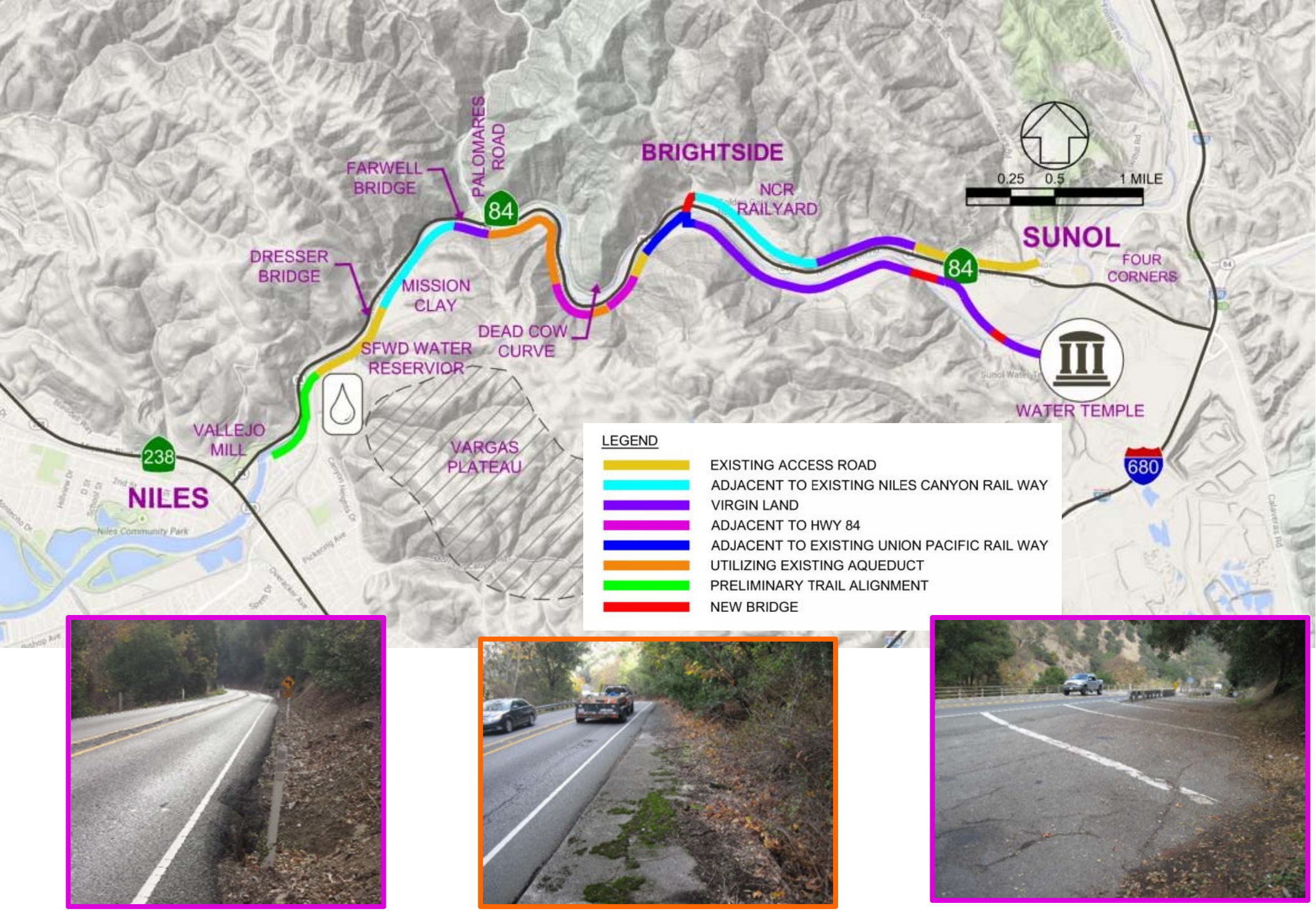


Figure 1-5 Canyon Trail along State Route 84

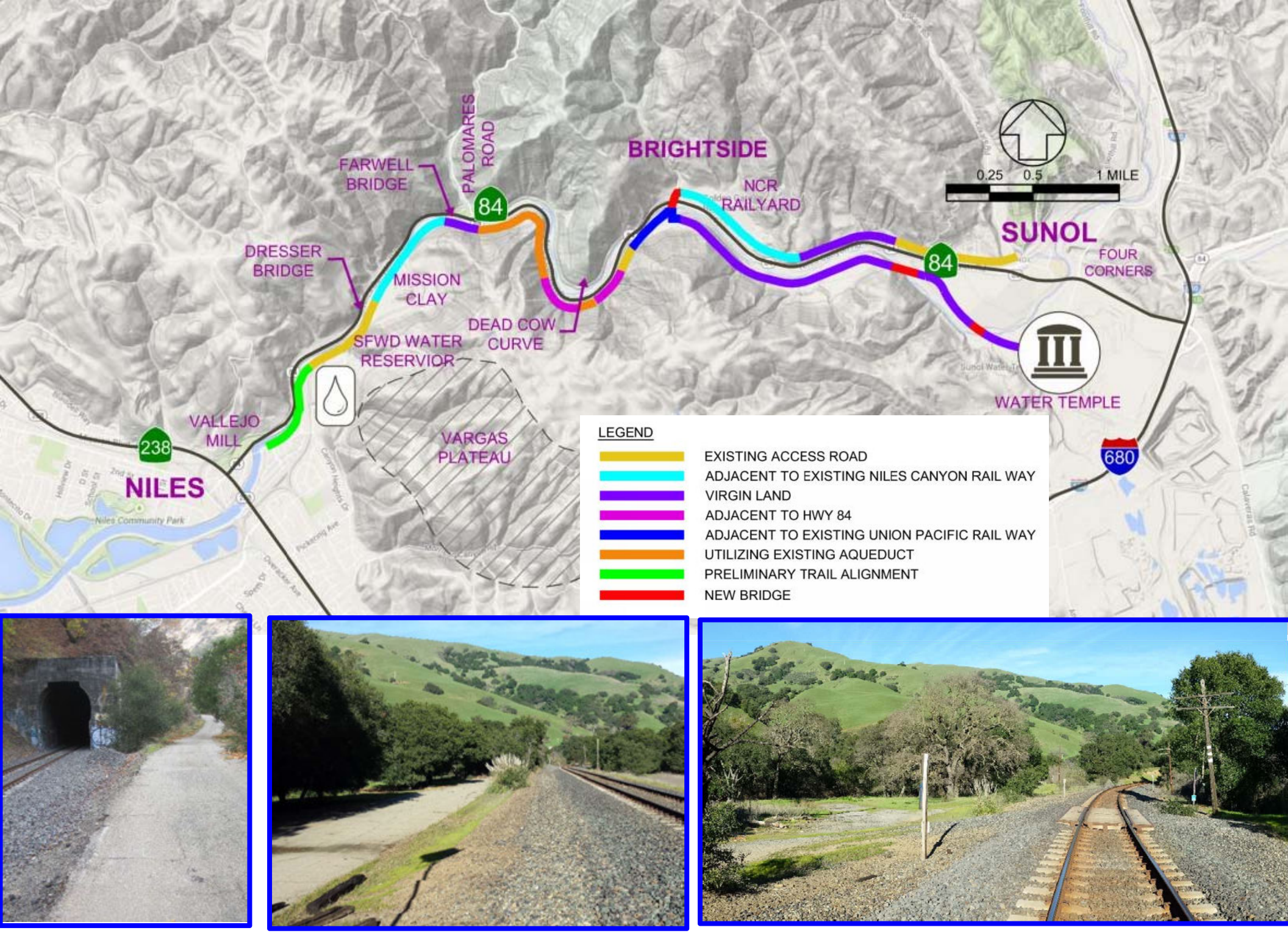
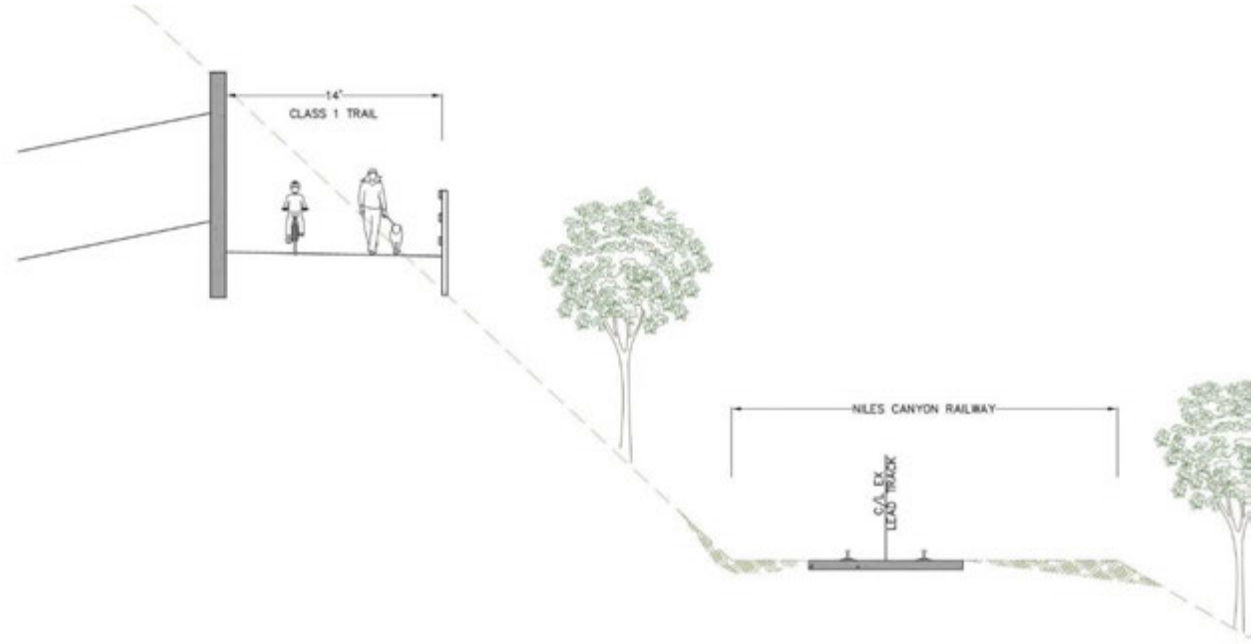


Figure 1-6 Canyon Trail along Union Pacific

Option 1 – North Canyon Trail. As illustrated in **Figure 1-7**, the trail will follow an alignment along the north face of Niles Canyon. For the trail to shift from the south to north side of the Canyon, the project will construct a bridge crossing Alameda Creek, Highway 84, and the Niles Canyon Railroad as illustrated in Figure 1-8. The project could locate the bridge near the remnants of the old highway bridge crossing. Given the length, the bridge will require multiple piers as well as extensive grading at the southerly abutment to create sufficient elevation to cross the highway.

Once on the north side of the Canyon, the trail will run upslope of the Niles Canyon Railway as shown in Figure 1-9. This will require the construction of walls to maintain vertical separation for the tracks. As the trail enters Brightside as shown in Figure 1-10, it could potentially be located on the north side of Niles Canyon Railway's maintenance facility. The location of the trail requires coordination with PLA to ensure the security of their equipment. The final segment as depicted in Figure 1-11 uses portions of Old Canyon Road and Foothill Boulevard to reach the Sunol train station.



Retaining walls are required on the north side of Canyon to install the trail east of Brightside.

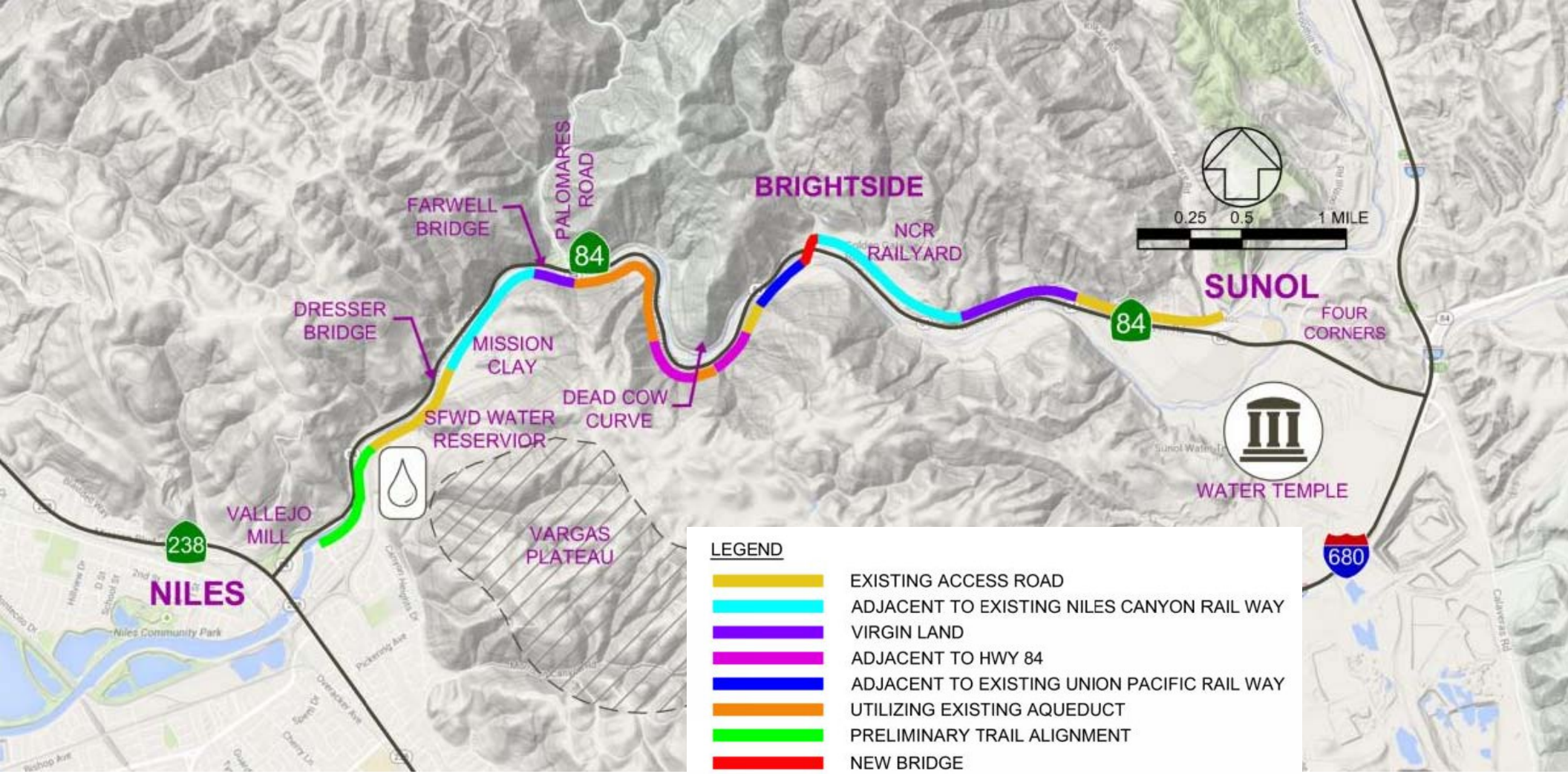


Figure 1-7 – Option 1 – North Canyon Trail

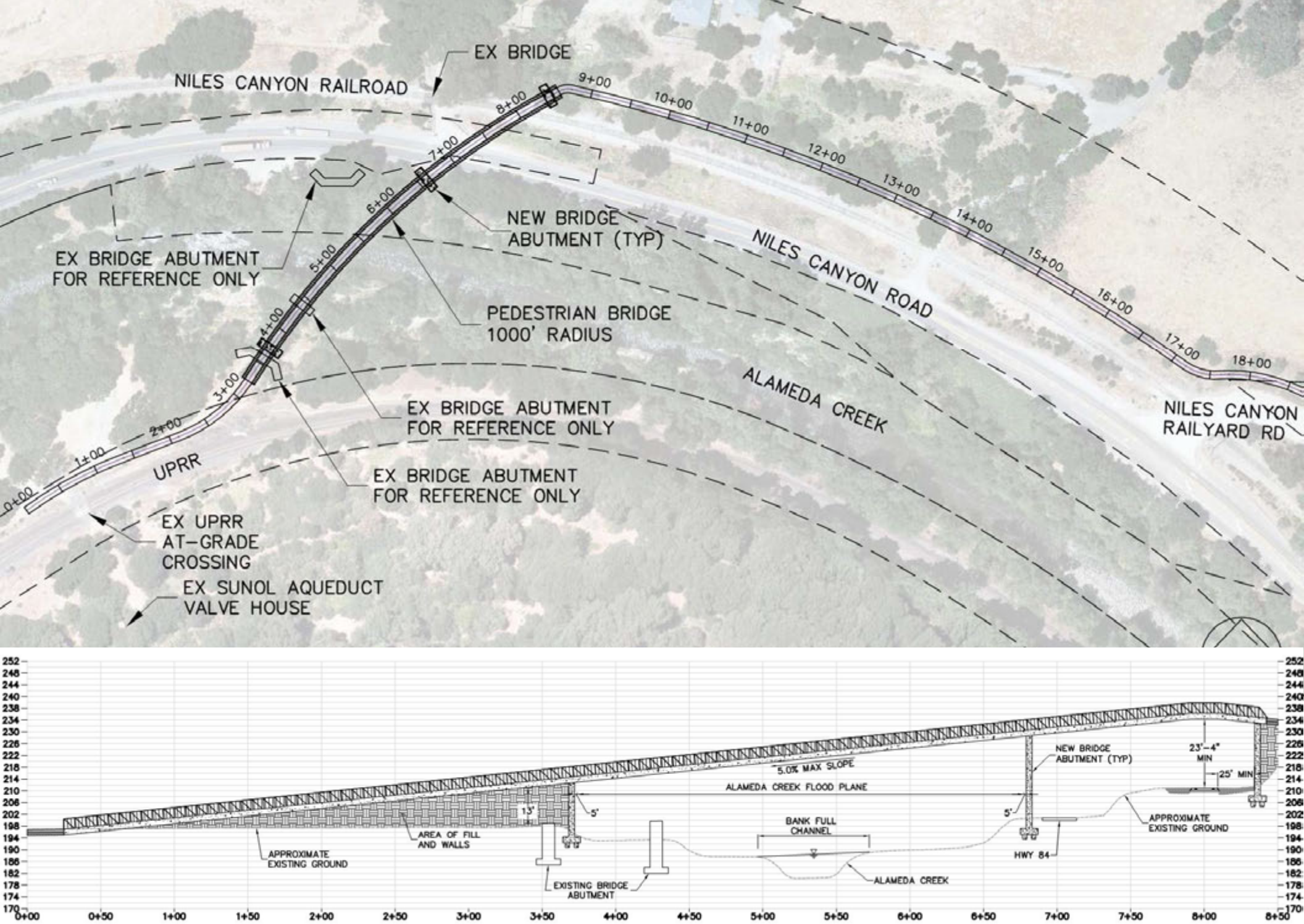


Figure 1-8 – Option 1 – North Canyon Bridge

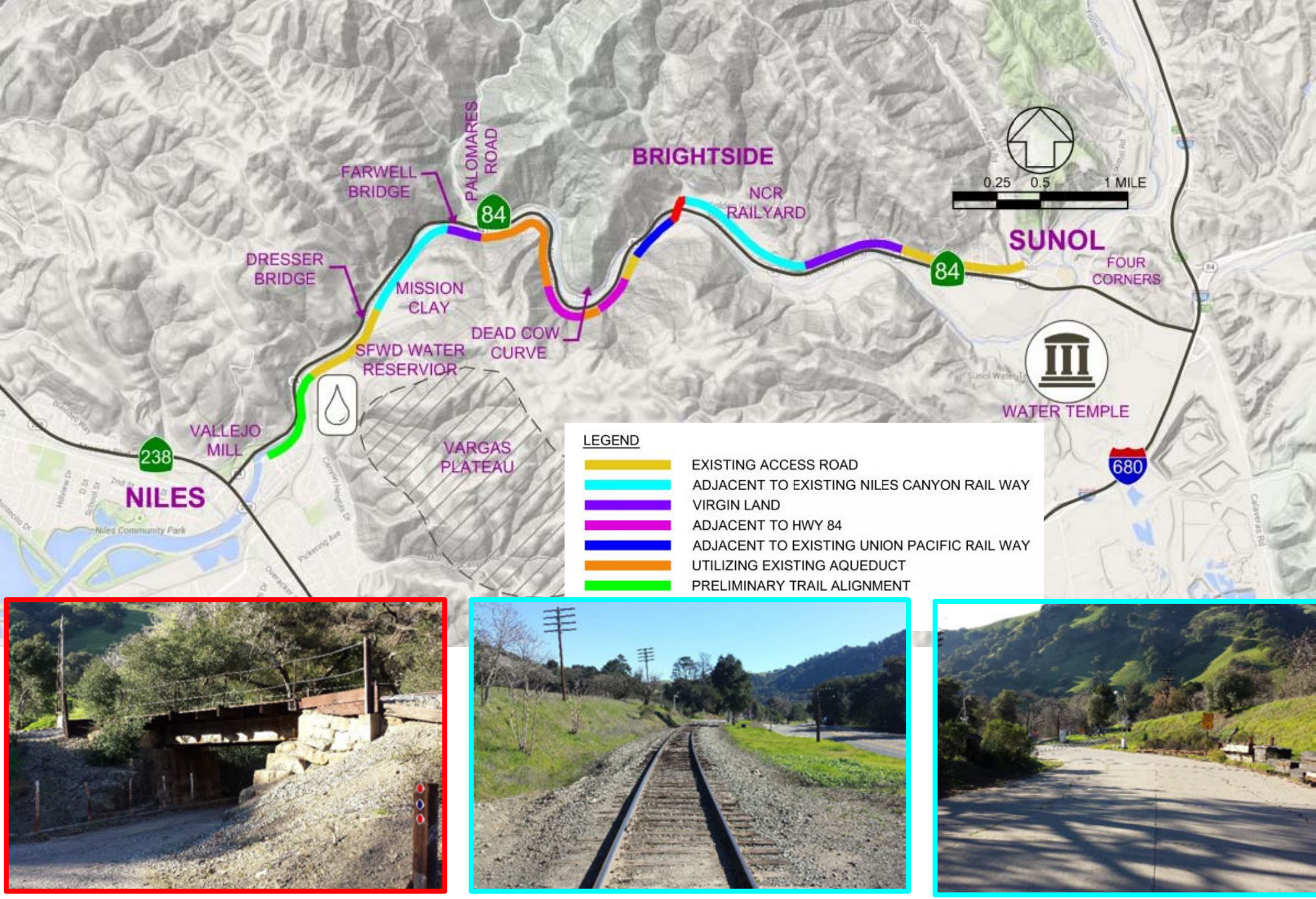


Figure 1-9 – Option 1 North Canyon Trail

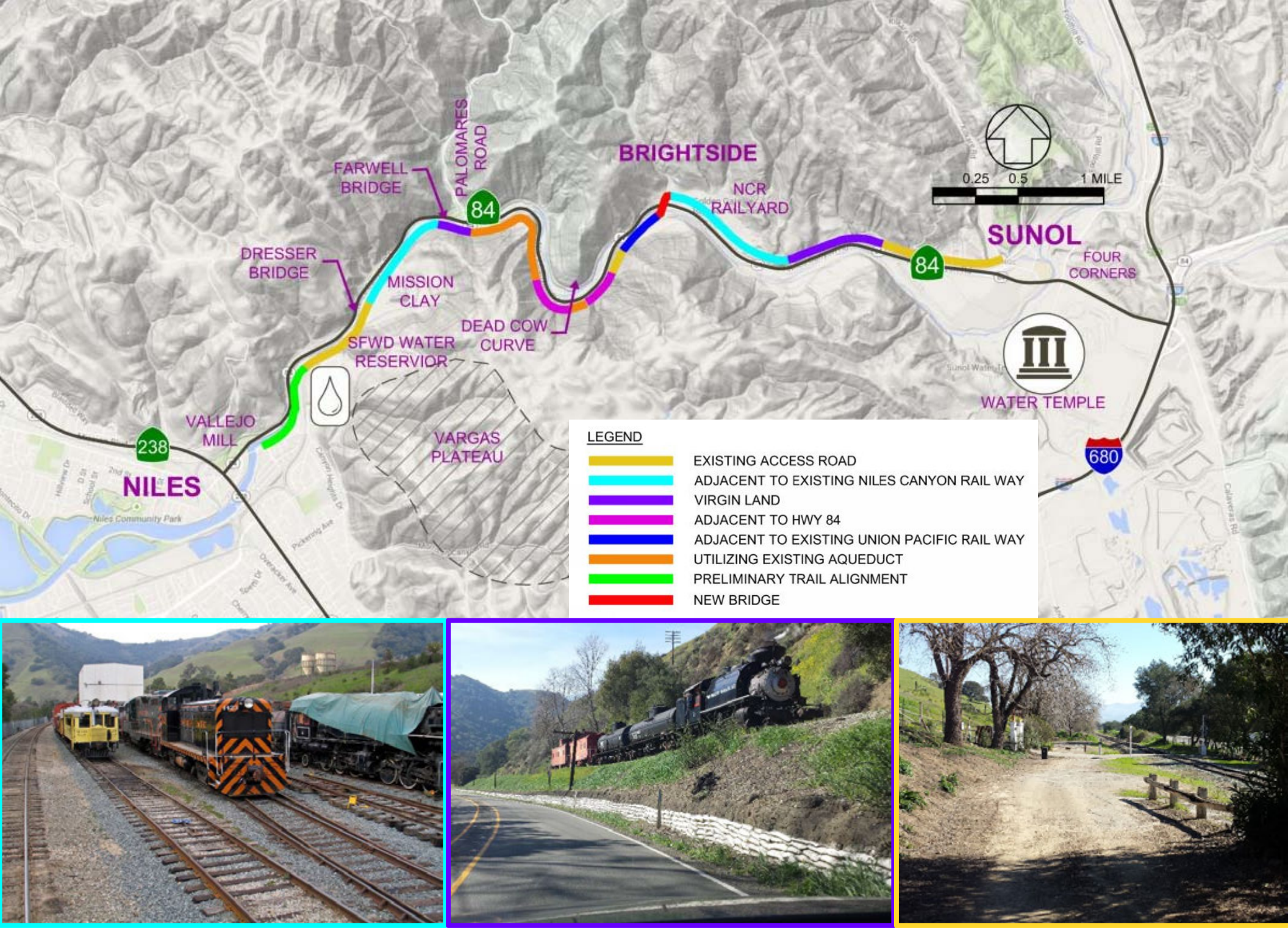


Figure 1-10 – Option 1 North Canyon Trail

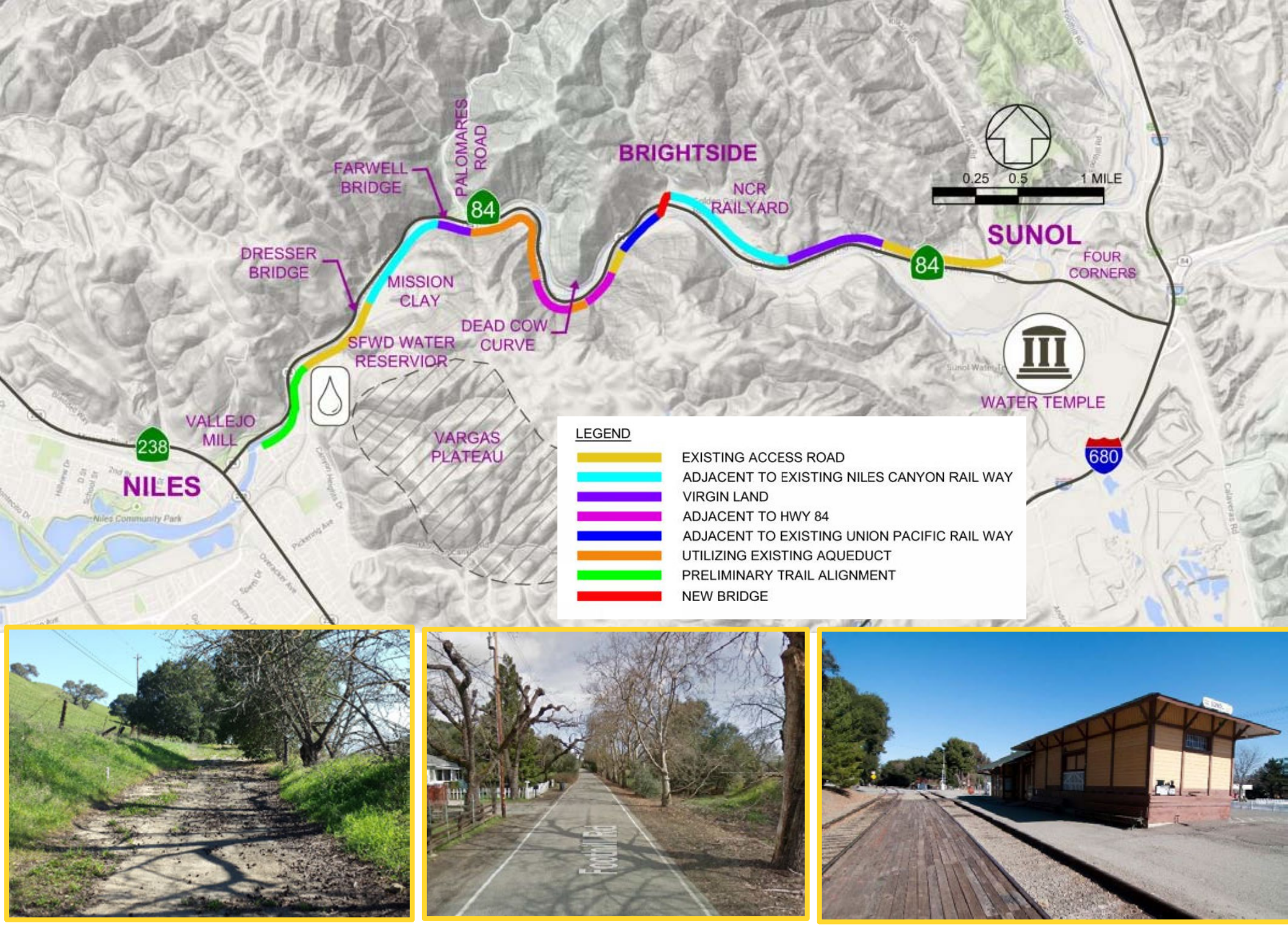
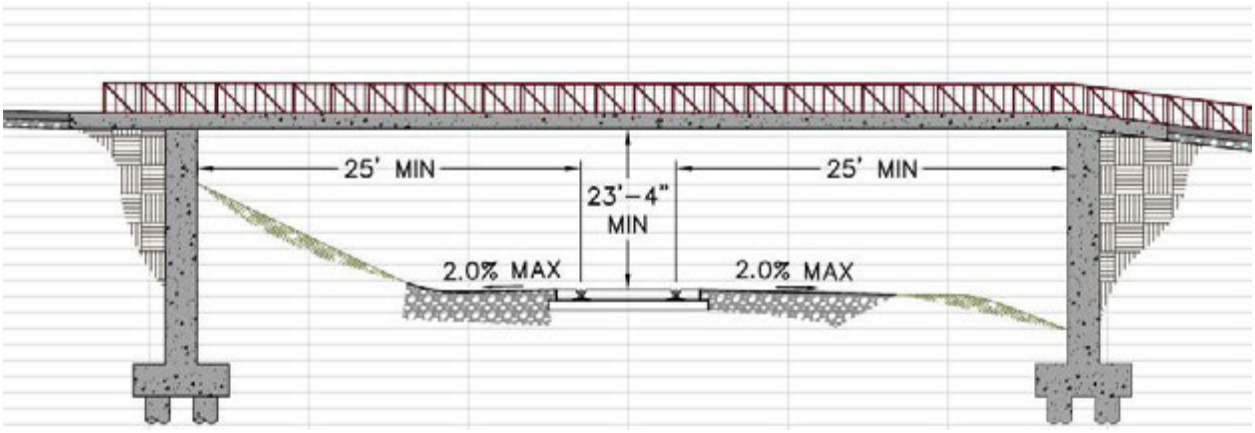


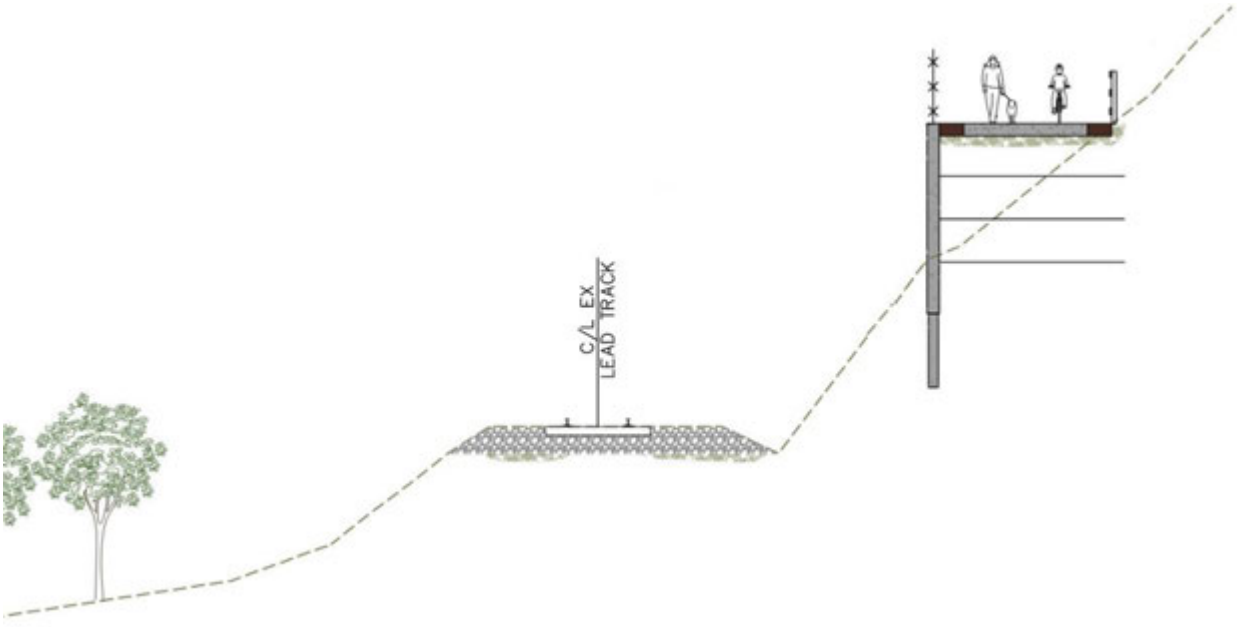
Figure 1-11 – Option 1 North Canyon Trail

Option 2 – South Canyon Trail. The second trail alternative, as illustrated in Figure 1-12, travels along the south side of Niles Canyon. To continue the trail, it must cross UP railroad near the location of the existing grade crossing panel. Due to limited sight distance as well as high train volume and speed, we recommend constructing a grade separation to cross the tracks. To provide for 23 feet of clearance, this will require extensive grading on both ends of the bridge.

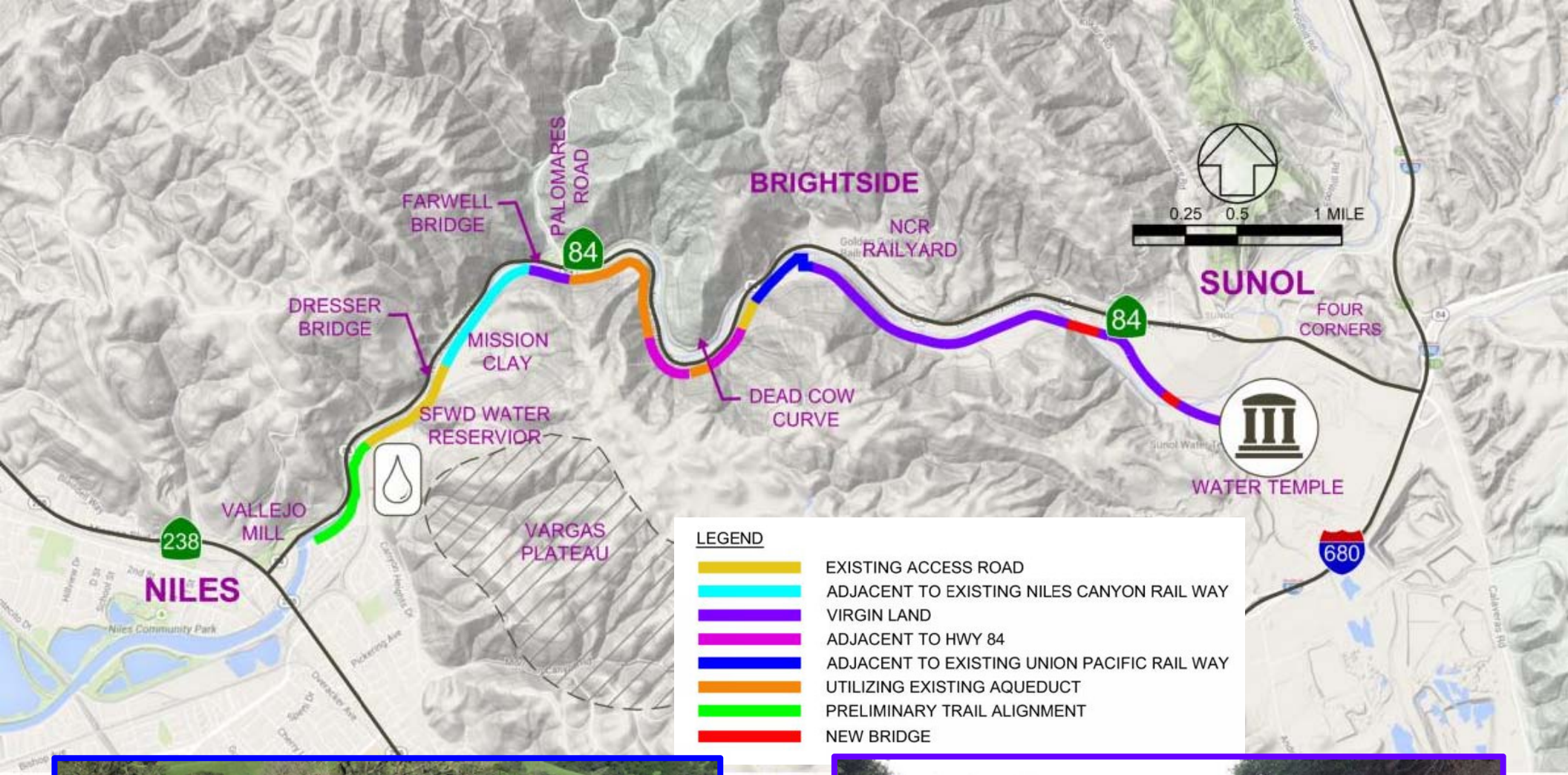
Once on the east side of the tracks as shown in Figure 1-13, the project will construct the trail through unimproved lands. In this area, the topography is steep and vegetation dense; the trail will require two bridges to cross Alameda Creek. The trail will end at the Sunol Water Temple.



The South Canyon option requires a bridge to cross the Union Pacific Railroad's right of way.



The topography on the south side of the Canyon east of Brightside is extremely steep likely requiring fill retaining walls.



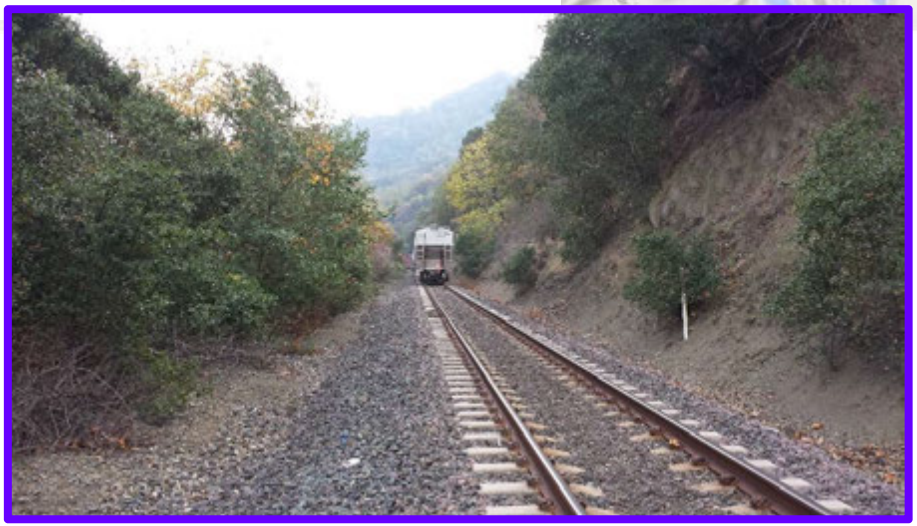
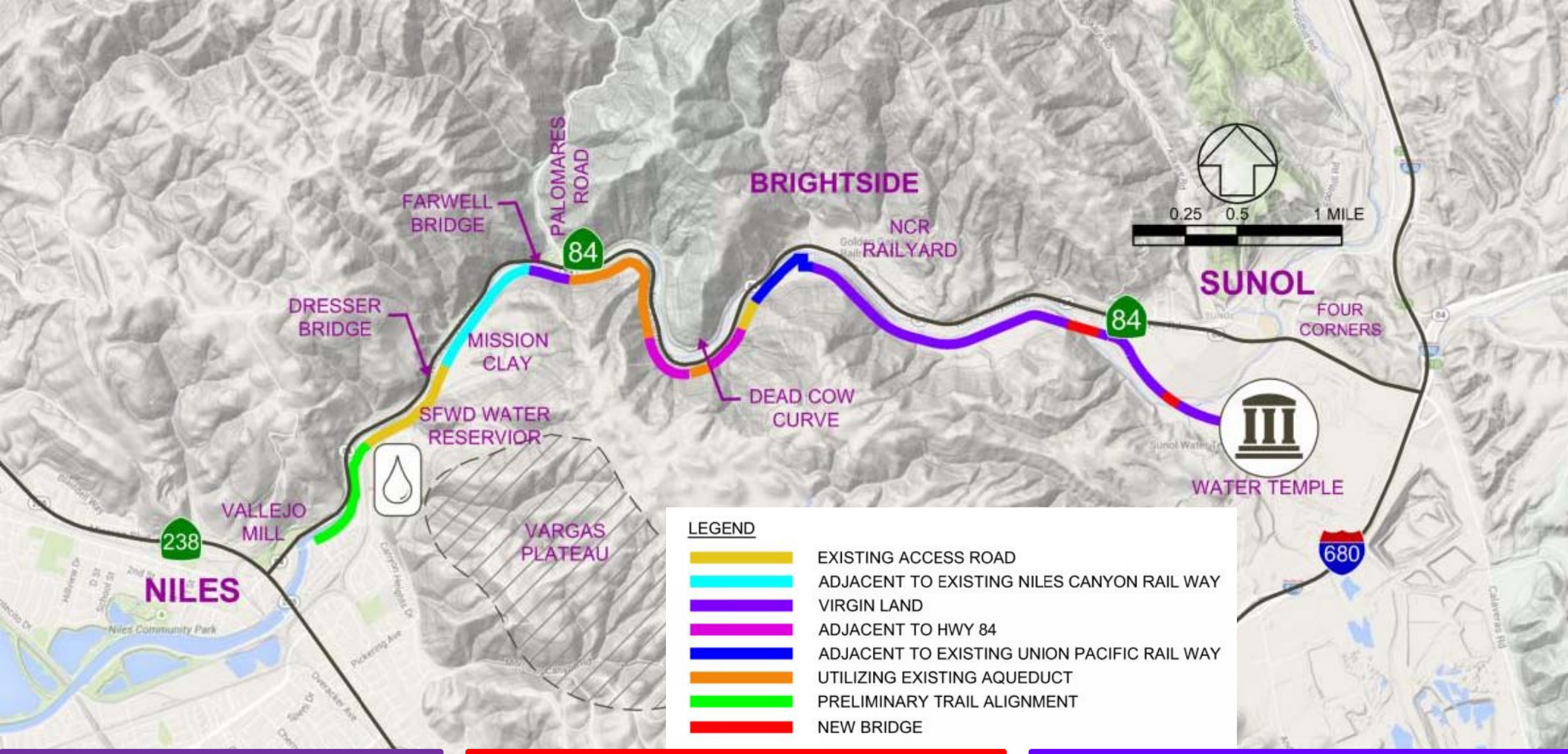


Figure 1-12 Option 2 South Canyon Trail



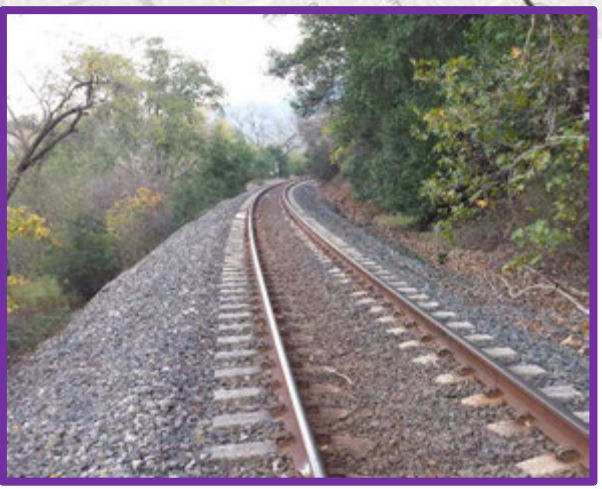


Figure 1-13 Option 2 South Canyon Trail

Option 3 - Rails with Trails. Along segments of Niles Canyon Railway, there is adequate area available to install a class 1 trail. While operating trails near active rail lines can present challenges, the volume and speed of the Niles Canyon Railway is small providing an opportunity for a parallel trail. To achieve a trail, the project would maximize horizontal separation, create a vertical separation where possible, and install a fence separating the uses.

Because of the limited operations of Niles Canyon Railway, the project could relocate the tracks, tightening curve radii especially in constrained sections to provide additional trail area. Since the tracks are in their historical alignment, adjustments are an impact under CEQA. Furthermore, this option requires coordination with the Pacific Locomotive Association to ensure reliable operation. This option could be a major benefit to the PLA as the improvements could reduce maintenance related to landslides and provide new tracks and ties.

Potentially, this could occur along the entire length from Sunol to Niles, but given that the westerly segment to Mission Clay is not complicated, the project could implement this alternative at Dresser Bridge as shown in Figure 1-14. The project would need to create a new crossing of Highway 84 parallel to the Farwell Bridge, which creates an important connection of Palomares Bridge.

Along segments of the Niles Canyon Railway, there is adequate area to place a trail.

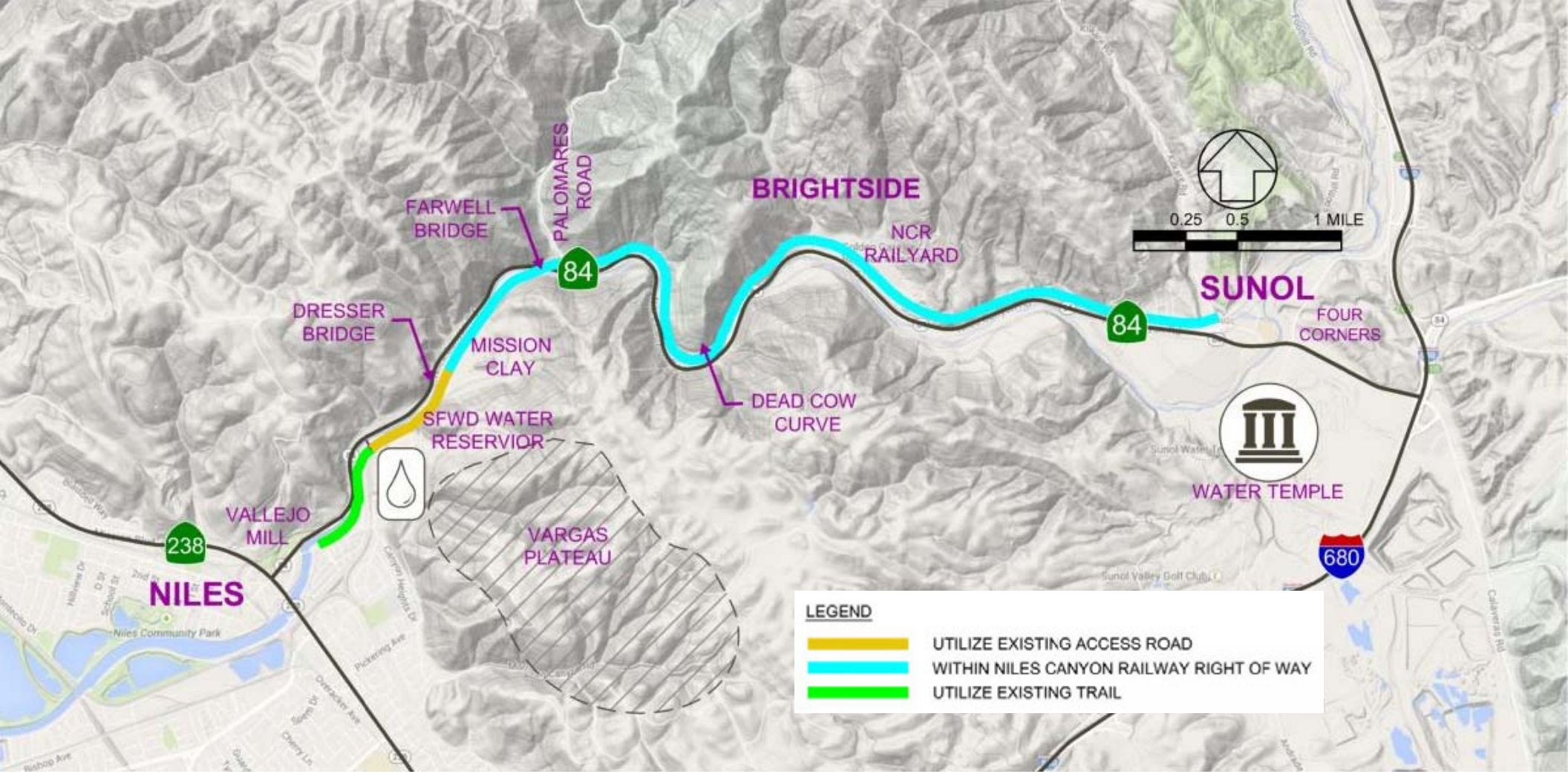


Figure 1-14 Option 3 Rails with Trails

Figure 1-15 Rails with Trails

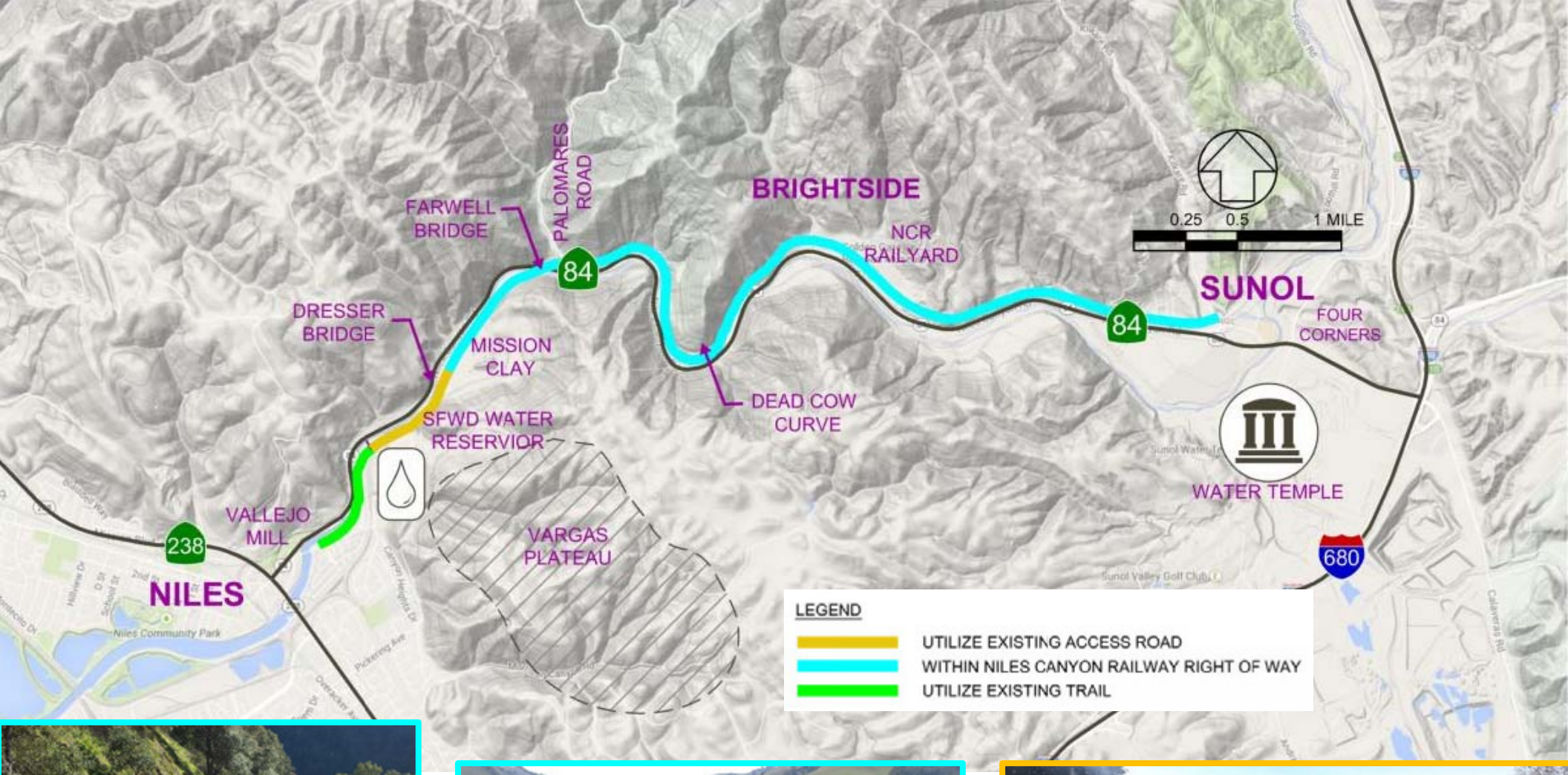


Figure 1-16 Rails with Trails

Design Elements. From feedback received, there is a strong interest in linking Palomares Road to the Niles Canyon Trail. As all options proposed have the trail south of Highway 84, to make the connection, the project requires a new pedestrian bridge that spans Niles Canyon Railway, Alameda Creek, and the highway as depicted in Figure 1-17.

As the trail will likely be a regional destination, it will need to accommodate users who travel by vehicle. As shown in Figure 1-18, parking lots exist on the west and east sides of the Canyon. On the west side, the Vallejo Mill lot can accommodate about 25 vehicles while the existing Niles Staging Area serving the Alameda Creek trail near Old Canyon Road provides 12 stalls. The Vallejo Mill lot is not optimum as users will need to cross Highway 84 to access the Niles Canyon Trail. On street parking could potentially be added along Old Canyon Road.

In Sunol, there is approximately 51 stalls at the train station. As parking demand increases on Sundays for Niles Canyon Railway events, the trail may require additional parking There is the potential to revise and expand the existing lot to increase capacity. We recommend evaluating parking demand by potentially reviewing trends at other regional destinations such as César Chávez Park in Berkeley, Devil's Slide Trail in Pacifica, or the Steven's Creek Trail in Mountain View.

Given the trail's length, the project will need to construct public restrooms. Figure 1-19 illustrates potential location. As water and sewer service are not existent along much of the alignment, the restrooms will need to be composting units.

Having hiked the segment on numerous occasions, we indicate scenic viewing and rest locations as shown in Figures 1-20 and 1-21.

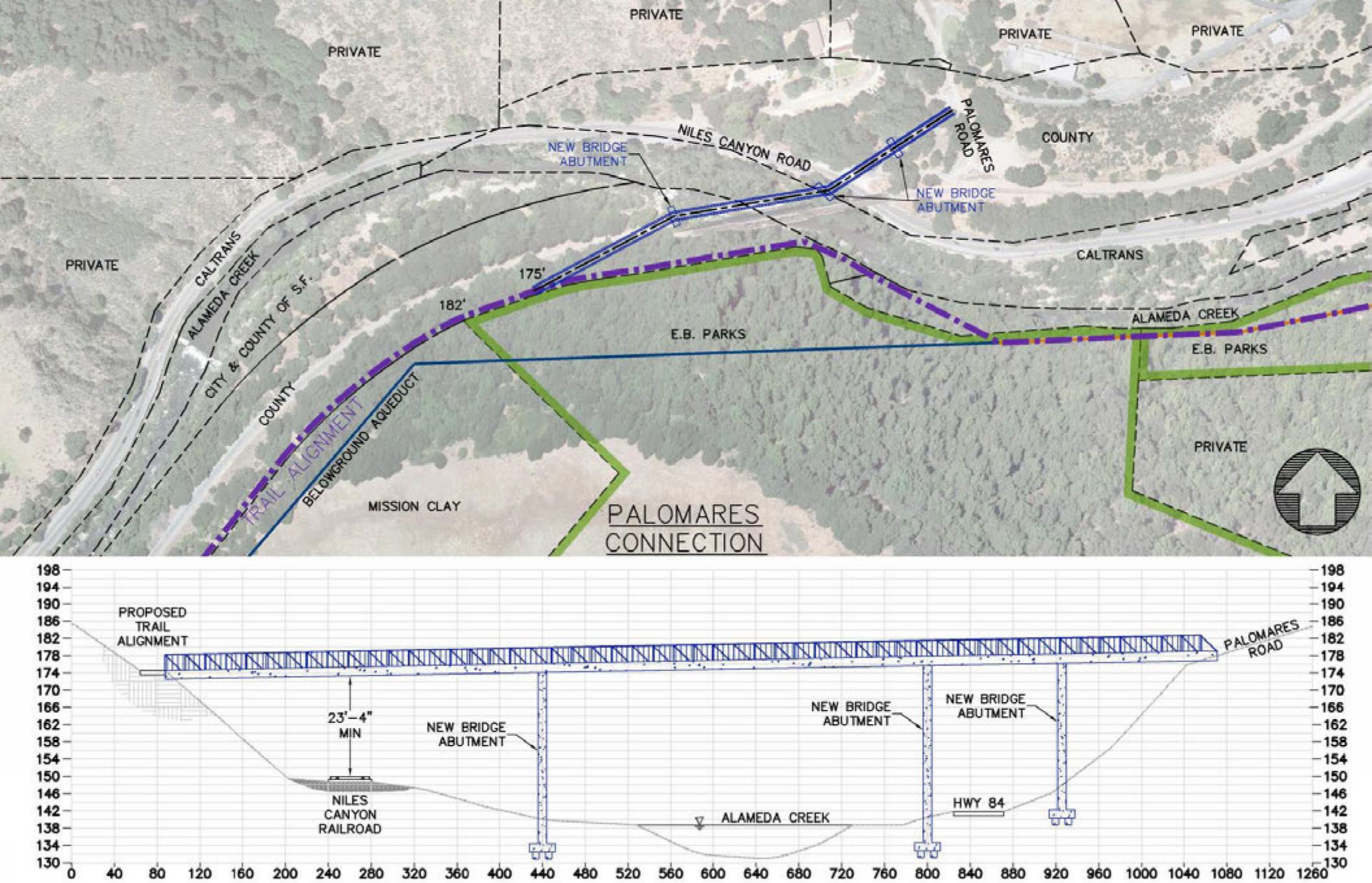


Figure 1-17 Connection to Palomares Road

Figure 1-18 Parking

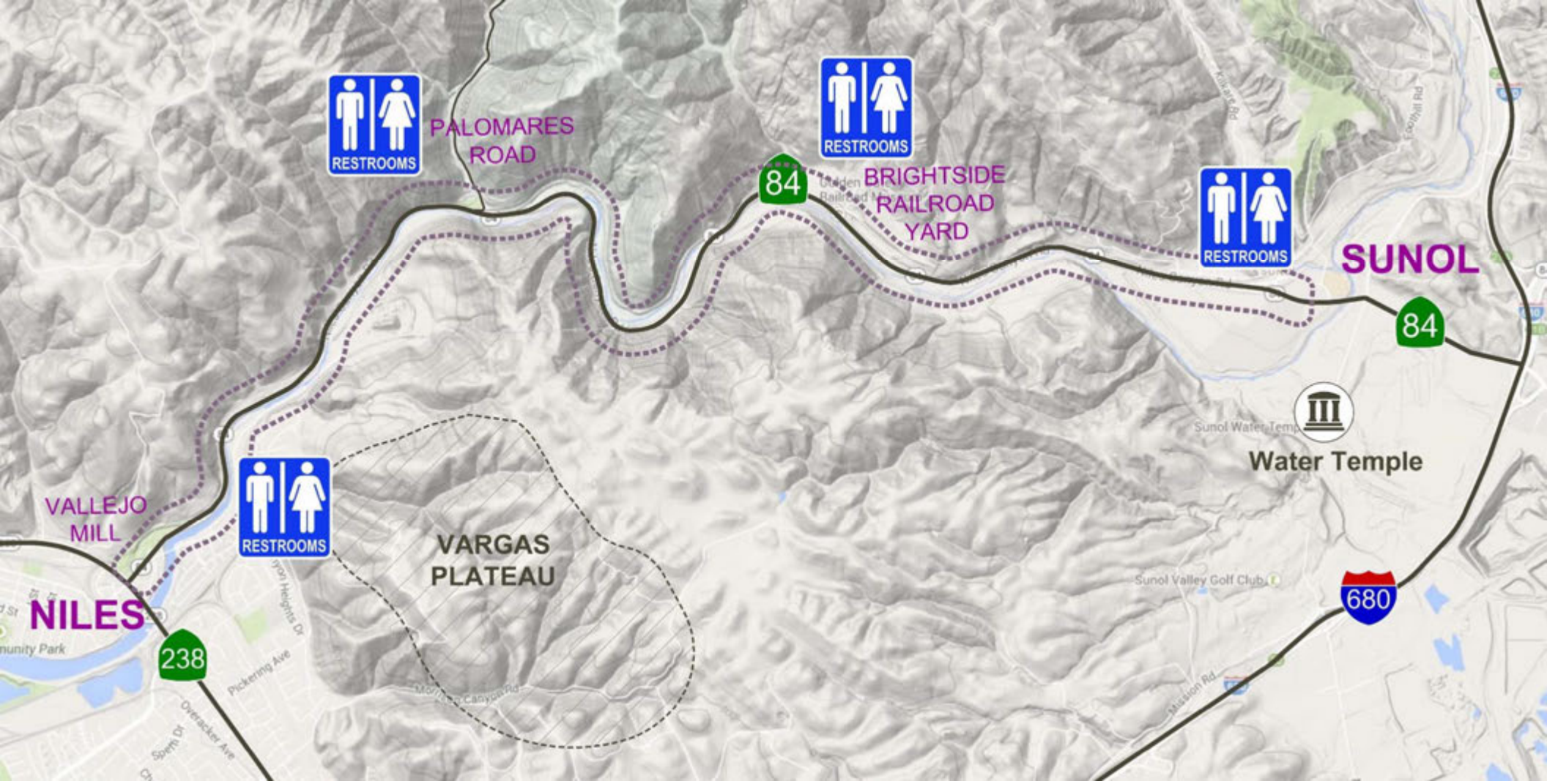


Figure 1-19 Restroom Locations

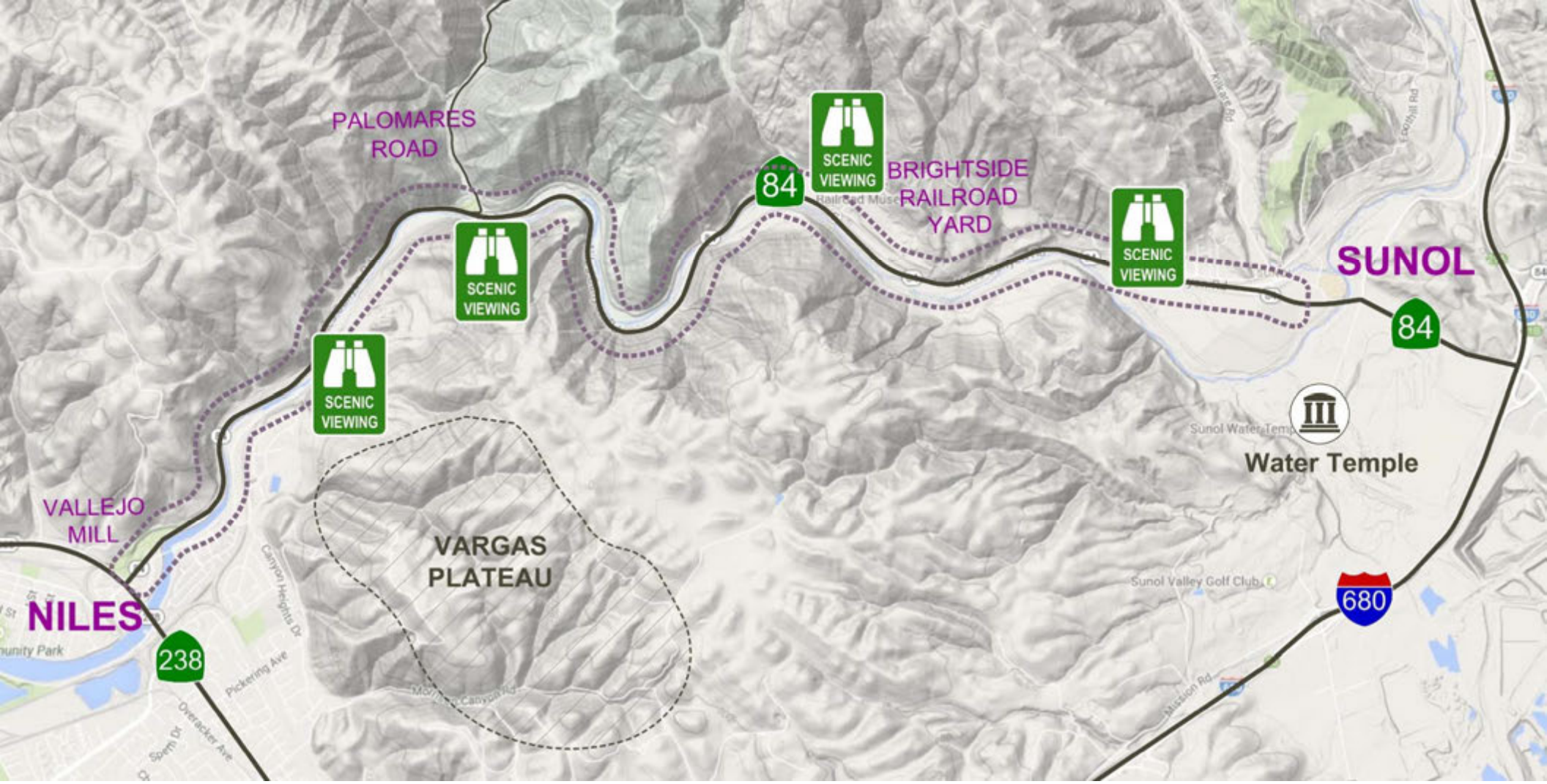


Figure 1-20 Scenic Viewing Locations

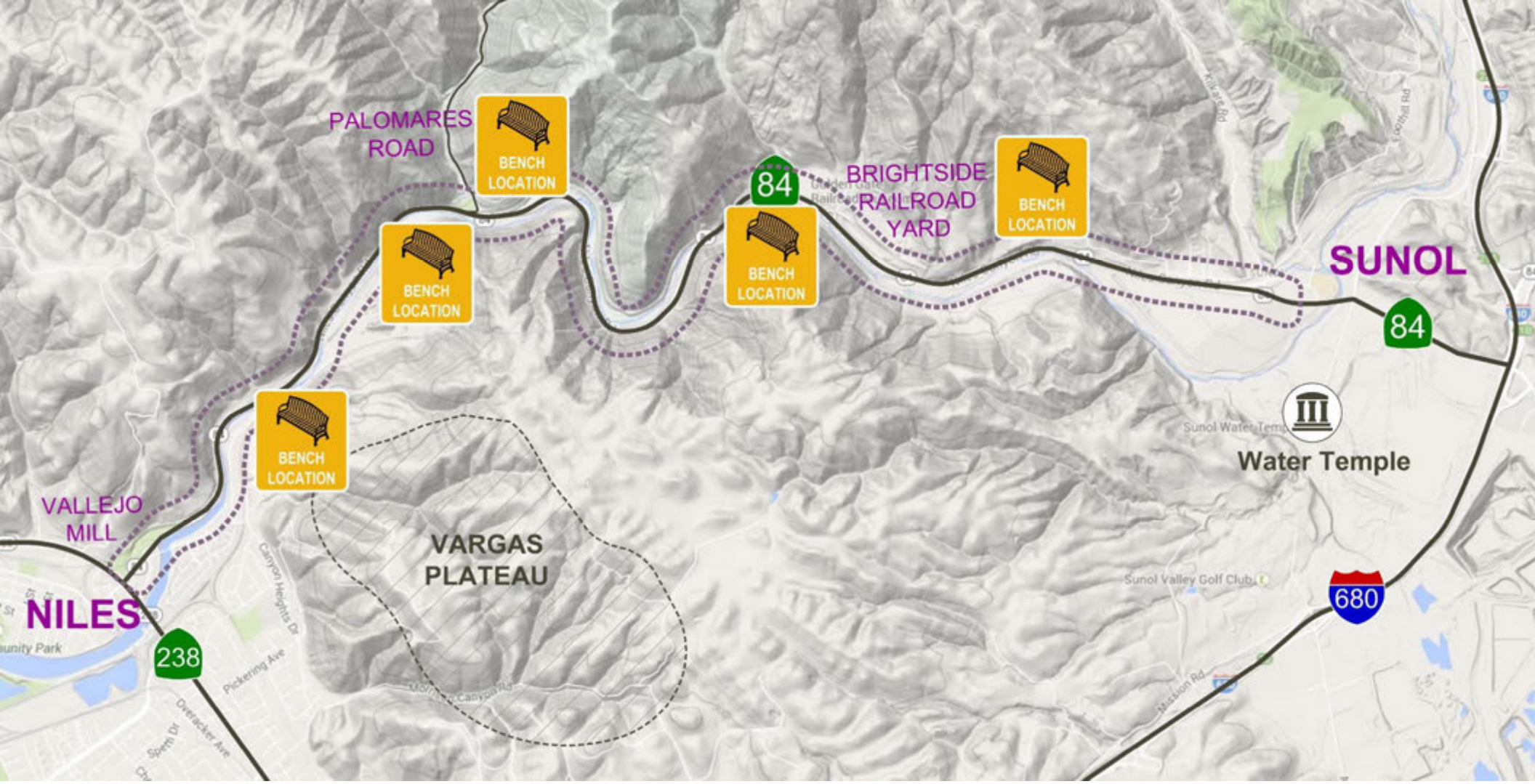


Figure 1-21 Bench Locations

Cost. The estimated cost to design, permit and construct the options:

Year	Cost (In Millions) Option 1 North	Option 2 South	Option 3 Rails with Trails
2015	$57	$65	$69
2025	$84	$96	$102
2035	$125	$142	$151

This estimate assumes an escalation factor of 4% for future years.

As the cost to construct the trail is large, we recomment developing it is a series of phases, each with independent utility. A recommended phasing strategy is shown in Figure 1-22 and summarized as follows:

Description	Cost (In Millions) Option 1 North	Option 2 South	Option 3 Rails with Trails
Total Project Cost (2015)	$57	$65	$ 69
Phase 1	$14.3	$14.3	$27.6
Phase 2	$28.6	$22.2	$27.6
Phase 3	$14.1	$28.5	$ 13.8

Note that phases constructed in future years will need to be escalated due to inflation.

Rights of Way. While most of the proposed trail is located on public property, there are several private parcels affected.

Biological Resources Considerations. The primary biological resource considerations relative to the proposed trail construction are:

1. Jurisdictional waters (Alameda Creek and tributaries) of the United States and State.
2. The presence of habitat for twelve special-status species (Chaparral harebell, Congdon's tarplant, Santa Clara red ribbons, steelhead, California tiger salamander, foothill yellow-legged frog, California red-legged frog, western pond turtle, Alameda whipsnake, burrowing owl, tricolored blackbird, and dusky-footed woodrat).
3. The potential presence of nesting birds protected under the federal Migratory Bird Treaty Act and California Fish and Wildlife Code.
4. The potential presence of roosting bats.
5. The presence of two sensitive/regulated natural communities (sycamore alluvial woodland and mixed riparian forest and woodland).

Steelhead, California tiger salamander, California red-legged frog, and Alameda whipsnake are federally listed species that are known to occur in the project vicinity. A formal Biological Assessment addressing potential project impacts to these species would likely need to be prepared for consultation with the USFWS and the National Marine Fisheries Service (NMFS) under Section 7 of the federal Endangered Species Act. The consultation would be done as part of the CWA Section 404 permitting process since the Corps would

need to demonstrate that the proposed activities would not result in adverse effects on federally listed species prior to issuing the permit. A *Not Likely to Adversely Affect* determination is likely if all proper avoidance and minimization measures are incorporated into the project design.

Foothill yellow-legged frog, western pond turtle, burrowing owl, tricolored blackbird, and dusky-footed woodrat are California Species of Special Concern that are also known to occur in the project vicinity. Potential impacts to these species are typically addressed under the California Environmental Quality Act (CEQA). Pre-construction surveys and/or additional mitigation measures may be required under the project's CEQA document (e.g., Initial Study or Environmental Impact Report).

Nests of all native bird species are protected under the federal Migratory Bird Treaty Act and Section 3503 of the California Fish and Wildlife Code, which prohibits the take, possession, or needless destruction of the nest or eggs of any bird. The trees and shrubs on the site provide nesting habitat for a wide variety of resident bird species, including white-tailed kite (a California Fully Protected Species) and yellow warbler (California Species of Special Concern). If conducted during the nesting season (typically defined by CDFW as February 1 to August 31), project activities could impact nesting birds by removing vegetation containing active nests and/or causing nest abandonment and subsequent reproductive failure due to prolonged loud construction noise. Potential impacts to nesting birds are typically addressed under CEQA with preconstruction nest surveys incorporated into the project description or as a mitigation measure in a project's CEQA document.

In addition, there is a known great blue heron rookery (nesting colony) south of the Sunol Water Temple and near one of the proposed crossings over Alameda Creek. The colony consists of approximately 15-20 nests and has been active since 1998 (Kelly et al. 2002). Herons are susceptible to disturbance from human activity near nesting colonies and may be impacted by hikers, bicyclists, etc. at the proposed crossing. Kelly et al. (2002) recommend a minimum buffer of 200 meters during the nesting season to prevent disturbance and possible nest or colony abandonment. Impacts to the colony should be considered during the design phase of the project.

Roosts of special-status bat species and maternity or hibernation roosts of all bat species are generally subject to protective measures. Additional requirements for tree cutting procedures may be required if there is evidence of day or night roosts for non-special status species. Project activities could impact roosting bats if any old structures or large trees with hollows will be demolished or removed by the project. Potential impacts to roosting bats would be addressed by federal or state permits for listed species or under CEQA for non-listed species. Pre-construction surveys for potential habitat would likely be required along the trail alignment with potential follow-up surveys to assess occupancy if potential habitat is found.

The CDFW tracks the occurrences of natural plant communities that have limited distributions statewide or within a county or region and are often vulnerable to environmental effects resulting from projects within or adjacent to them. In the CDFW's most recent Natural Communities List (CDFG 2010), vegetation alliances with State rarity rankings of S1–S3 are considered "highly imperiled" and project impacts to "high-quality occurrences" of these alliances could be considered significant under CEQA. Most types of wetlands and riparian communities are also considered special-status natural communities due to their limited distribution in California. There are two sensitive natural communities, sycamore alluvial woodland and mixed riparian forest and woodland, within the study area.

Preferred Option: The team ranked each trail option in accordance with reference to the project goals by asking the following series of questions:

- Does the trail option provide a good user experience?
- How significant will the trail's construction impact environmental resources?
- Will the trail disrupt historical resources within the Canyon?
- What is the cost to implement the trail?

Goal	Option Ranking Highest	Lowest	Rational
User Experience	Option 1	Option 2	Connects directly to Sunol
Protection of Environmental Resources	Option 3	Option 2	Minimizes tree removal
Protection of Historical Resources	Option 2	Option 3	Limits changes to rail
Cost to Implement	Negligible	Negligible	All costs similar

While there is not a clear preferred option, at this time, the team believe the North option (Option 1) is preferred given the following:

- The South Canyon Trail has potentially significant impact on environmental resources due to potential tree removal and grading within area previously undisturbed.
- The South Canyon Trail does not directly connect to Sunol
- The North Canyon Trail requires only one major bridge to complete the alignment while the South Canyon has three.
- The South Canyon Trail requires a bridge across UP right of way which can be costly to permit
- The Rails to Trails option will require a major adjustment to the existing tracks, which could affect Niles Canyon Railway's operations as well as create a potential environmental impact.

Approvals. This project will likely require the preparation of an Environmental Impact Report consistent with the requirements of the California Environmental Quality Act. Upon certification of the document, to construct this segment the EBRPD will need to secure grading permits from Alameda County and the City of Fremont for work within their respective jurisdictions. For crossing of State Route 84 and railroad, the District will need encroachment permits from the respective jurisdictions.

To construct the bridges crossing Alameda Creek, the project will need to obtain the following regulatory agencies:

- U.S. Army Corps of Engineers (Federal Clean Water Act [CWA] Section 404 Permit)
- Regional Water Quality Control Board (CWA Section 401 Water Quality Certification)
- U.S. Fish and Wildlife Service (Section 1602)

Recommendations and Next Steps. To advance, the trail between Niles and Sunol we recommend the following:

1. Identify unstable rock formations within the trail's alignment
2. Formalize the design of the North Canyon Trail defining the precise alignment and impact to adjacent resources including:
    a. Define locations of minor bridges and culverts necessary for the trail
    b. Assess the capacity of the Sunol Aqueduct to be converted into a trail
    c. Define a strategy to stabilize rock formations by using rock netting

    d. Define the length and height of retaining walls
    e. Coordinate with the PLA to route the trail through Brightside
    f. Define all locations of tree removal
3. Prepare an initial study, technical studies, and environmental impact report
4. Submit segments of the project for funding through federal and state grant opportunities
5. Complete a study to determine the total number of parking stalls required at Niles and Sunol
6. Work with local leaders to increase knowledge and public support for the trail

Figure 1-22 Phasing

SEGMENT 2 – BAY AREA RIDGE TRAIL RAILROAD CROSSING

Introduction. The East Bay Regional Park District is working to develop a section of the Bay Area Ridge Trail north of State Route 84 in Fremont. The development of the Bay Area Ridge trail is extremely popular in East Bay Communities and providing access to staging areas is critical for the public's enjoyment. To connect the trail to the Vallejo Mill staging area, it must cross railroad tracks used by the Niles Canyon Railway. The proposed crossing of the Niles Canyon Railway (NCR) as operated by the Pacific Locomotive Association (PLA) is located just east of Mission Boulevard in the Niles District of Fremont. PLA leases the rail corridor from Alameda County. This corridor is the original alignment of the transcontinental railroad constructed by the Western Pacific Railroad Company in about 1866.

Railroad Track Crossing for the Bay Area Ridge Trail.

The California Public Utilities Commission (CPUC) has jurisdiction over rail crossings in California while the Federal Railroad Administration (FRA) is responsible for overall rail safety in the United States. The CPUC must approve all railway crossing of roadways and highways prior to construction. Although we are not clear if the CPUC has jurisdiction regarding trail crossings, this report uses their guidelines as basis of design. All crossings must conform to California and federal accessibility regulations.

The District finalized the alignment of the Bay Area Ridge Trail establishing a proposed location to cross the tracks. Topographic and land use constraints fix the location of the crossing. To the south of the crossing, the trail will enter Vallejo Mill Park, which the City of Fremont owns and operates.

The proposed crossing location to serve a 48-inch wide non-paved trail is just east of the railroad track overcrossing of Mission Boulevard. At this location, two tracks transition to one as the alignment travels toward Niles. Where there are two tracks, the north track leads to the Niles train station while the south heads to San Jose. The existing ground to the north is extremely steep sloping upward to the ridge while the terrain to the south slopes down to Highway 84; the elevation change is approximately 40 feet.

Location of crossing just east of Mission Boulevard.

Existing Crossing. Both stakeholders and community members expressed an interest in using the sidewalk along Mission Boulevard located under the existing railroad bridge to cross the tracks. Unfortunately, this is not a feasible option as the sidewalk is too narrow to accommodate bicycle, pedestrian, and equestrian users. Due to the proximity to vehicular traffic and the constricted sidewalk width, this is especially unsafe for equestrian usage. Narrowing the travel lanes is not feasible as the current configuration conforms to the State of California Department of Transportation's requirements. Finally, securing right of way to access the crossing on the north side is costly due to potential development of the parcel.

Using the existing grade crossing at Mission Boulevard is not feasible as it is narrow and the District does not have right of way for access.

Niles Canyon Railway and Future Uses. The PLA is a nonprofit entity that operates the NCR as museum illustrating railroad operations specifically during the period of 1910 to 1960. Trains travel between Niles and Sunol from February to December. According to the current schedule, passengers board on specific Sundays at the Niles station at 11:30 AM and 1:20 PM and at Sunol at 10:30 AM, 12:30 PM, and 2:30 PM. During late November and December, PLA provides a holiday event with trains operating on Wednesday and Friday to Sunday. Thus, PLA runs about 51 days per year with about 205 train trips not including maintenance, serving about 47,000 riders annually. PLA operates both historic diesel and steam locomotives along the corridor typically with four passenger cars, at a maximum allowable speed of 30 mph. However, the trains typically operate at about 20 mph.

Altamont Corridor Express (ACE) who currently operates passenger rail service between the Central Valley and South Bay uses the Union Pacific's tracks located on the south side of Niles Canyon. In discussions with ACE, we understand there are plans to increase trips to accommodate additional passenger demand. However, Union Pacific cannot accommodate additional ACE traffic on their rail corridor. ACE is studying options including improving the tracks operated by the PLA to accommodate either ACE passenger or UP freight traffic. As this is an expensive option, ACE is additionally reviewing options to add a siding on the Union Pacific right of way on the west side of the Canyon.

Crossing Options. In investigating options to cross the tracks, the report considers several factors including:

2. likely approval of the CPUC if required for a trail;
3. user safety;
4. minimizing impacts to NCR's operations;
5. maintaining the trail user's experience;
6. limiting environmental impacts; and
7. minimizing capital and operational costs.

This report considered three alternatives to cross the NCR tracks including:

1. A pedestrian at grade crossing of the tracks
2. An undercrossing of the tracks at two locations
3. An overcrossing of the tracks as shown

Option 1 - At Grade Crossing. While we are unsure if either the FRA or CPUC have jurisdiction to regulate at-grade crossing of a non-motorized trail, the team developed a design consistent with published standards. Both the FRA and CPUC recognize that at-grade crossings present inherent hazards to the traveling public and recommend eliminating at-grade crossings where possible. However, where it is not practical to develop an alternative, the CPUC published, "Pedestrian-Rail Crossings in California" dated May 2008. The document offers guidelines for designing at-grade crossings considering the following factors: train speed, frequency, switching, stopping distance, and the existence of multiple tracks. Agencies successfully employ at grade crossings throughout California including CALTRAIN along the Peninsula.

The critical factor in developing an at-grade crossing is providing an unobstructed view for the pedestrian of oncoming trains allowing the individual to determine if sufficient time exists to cross the tracks safely. This distance depends upon train speed, crossing width, perception-reaction time of a pedestrian, walking speed, and the crossing geometry. Should the pedestrian's sight distance be insufficient, the at-grade crossing could add passive and active devices such as fencing, swing gates, pedestrian barriers, signs, flashing light signals, audible devices, and automated gates to enhance safety.

Location of at grade track crossing

To establish the minimum sight distance, the crossing must allow for 2 seconds of pedestrian decision and reaction time. The crossing of the NCR as shown in Figures 2-1 and 2-2 is 34 feet. Using a travel speed of 3.5 feet per second (FPS), it will take a pedestrian about 10 seconds to cross the tracks (34 feet / 3.5 FPS). Adding 2 seconds of reaction time, the crossing must allow for a total of 12 seconds for a pedestrian to clear the tracks. Thus, pedestrians must have a clear view of 530 feet (30 mph * 5,280 feet/mile / 60 minutes/hour / 60 seconds/minute * 12 seconds) to see a train approaching at 30 mph (maximum travel speed allowed) to determine if they can cross the tracks. As shown in the exhibit and as confirmed by field review, there is about 530 feet of sight distance available at the proposed track crossing location. Clearing of vegetation to the east of the crossing would improve sight distance. This crossing would require two CPUC Standard 1-D signs on each side of the crossing.

CPUC Standard 1-D Signs

A concern related to the at-grade crossing is an increase in noise. Under the Code of Federal Regulation, train engineers must begin to sound train horns at least 15 seconds, and no more than 20 seconds, in advance of all public grade crossings. They must use a standardized pattern of two long, one short, and one long blast repeating the pattern until the lead locomotive occupies the grade crossing. Communities can eliminate the horns by creating quiet zones, but must study and potentially implement improvements to reduce the increased risk of collisions due to the absence of horns. An alternative to reduce noise may be the use of wayside horns. The process starts with a diagnostic meeting with the FRA, PUC, and railroad.

The work to construct at-grade crossing includes the removal of the existing tracks, ties, and ballast, which the option replaces with a concrete grade panel. It takes about two weeks to construct this option and limits downtime to NCR for about 2 days. The total cost to implement this option including design, permitting, and construction costs is about $500,000.

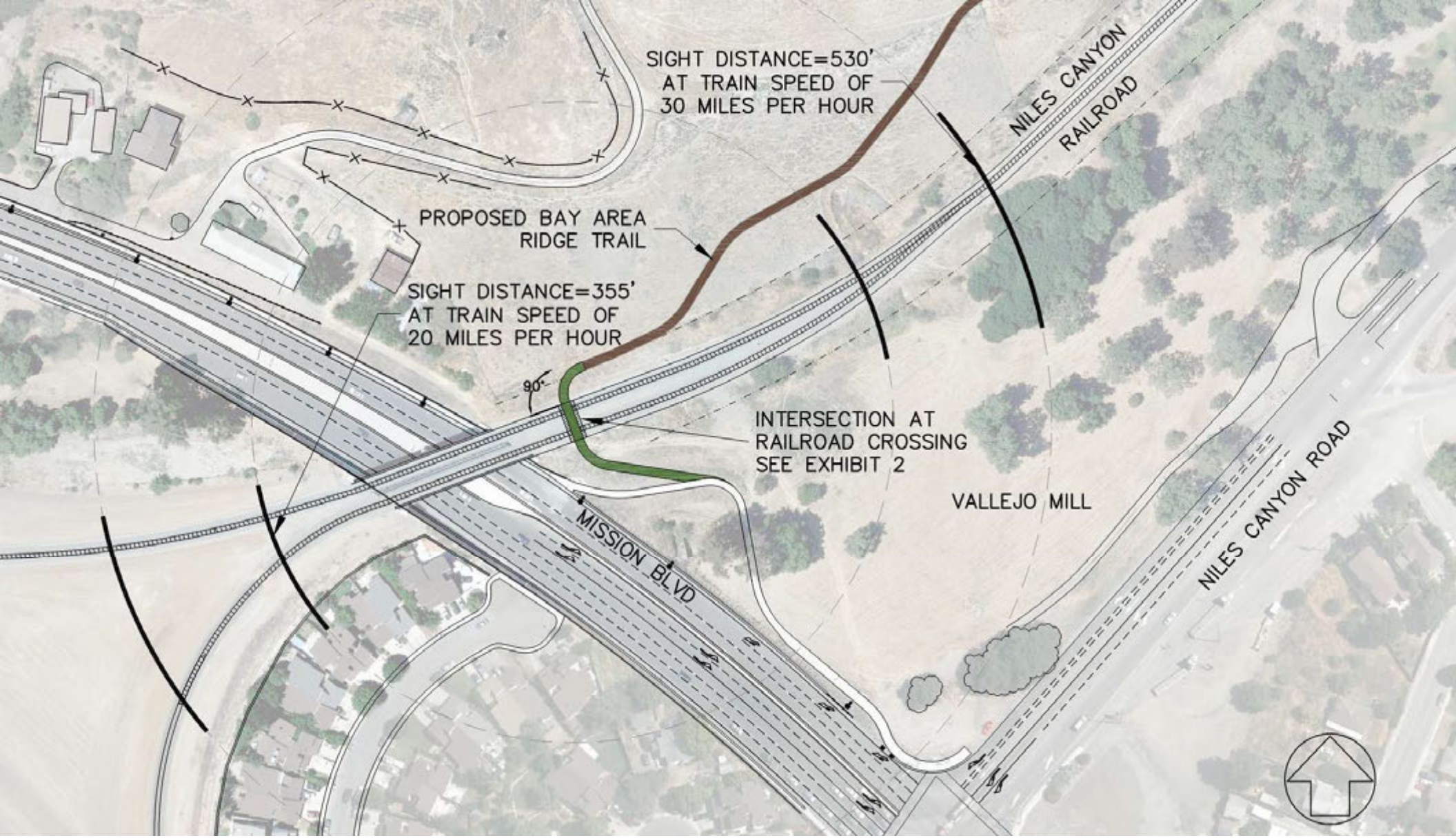


Figure 2-1 – At-Grade Crossing Sight Distance

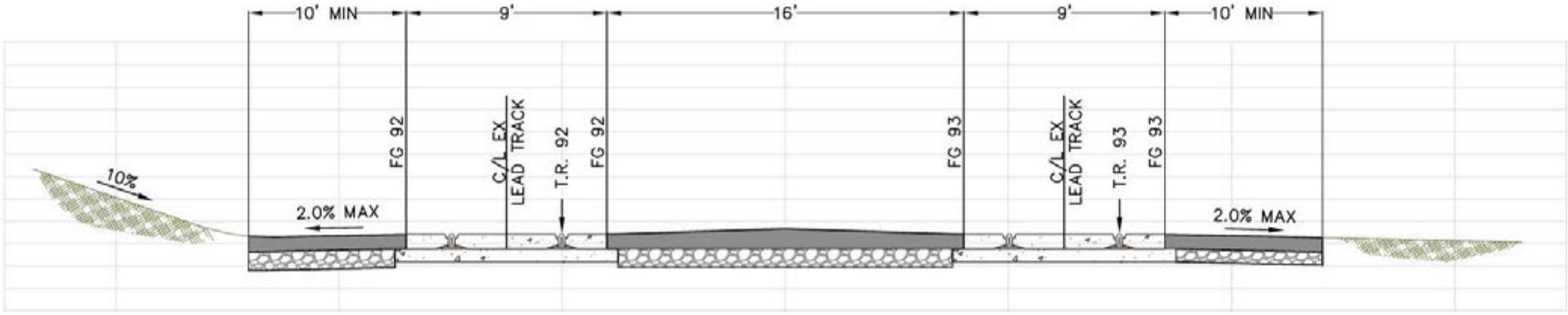


Figure 2-2 – At-Grade Crossing Cross Section

Option 2 – Undercrossing. This option takes advantage of the lower terrain located to the south of the NCR by installing a tunnel below the tracks. As shown in Figures 2-3 and 2-4, this would provide pedestrians with a clear height of 10 feet. It locates the crossing further to the east of Option 1 avoiding the two tracks. Given existing terrain located to the north and south of the crossing, the option would require significant excavation until the pathway could transition to meet the existing conditions at accessibly compliant grades.

Based on discussion with representatives of the PLA, they indicate that the location as shown in Figures 2-5 and 2-6 may be the preferred location to create an undercrossing given the existing topography. At this location, both the north and south side of the tracks are depressed allowing less excavation to create the crossing. However, to access the north side of the crossing, the trail requires extensive grading and possibly the construction of retaining walls.

The work to construct the undercrossing would require removal of the tracks and excavation as required to install sections of a prefabricated concrete tunnel. Once installed and backfilled, the option would re-install the tracks. It would take about 3 months to complete this option with the NCR not allowed to operate in the area. The total cost to construct the option depicted in Figures 2-3 and 2-4 is about $1.3 million. For Figures 2-5 and 2-6, we anticipate the cost to be about $2 million. Pedestrians would be located below the ground for a significant stretch of the crossing, which does not provide the optimal user experience and potential safety concerns. From feedback received in community meeting numbers 2 and 3, this was not an option desired by the community. The City of Fremont is also opposed to an undercrossing for safety and security reasons, being that it would not be easy to patrol for homelessness and criminal activity. The equestrian community especially found this option unfavorable.

Figure 2-3 – Undercrossing

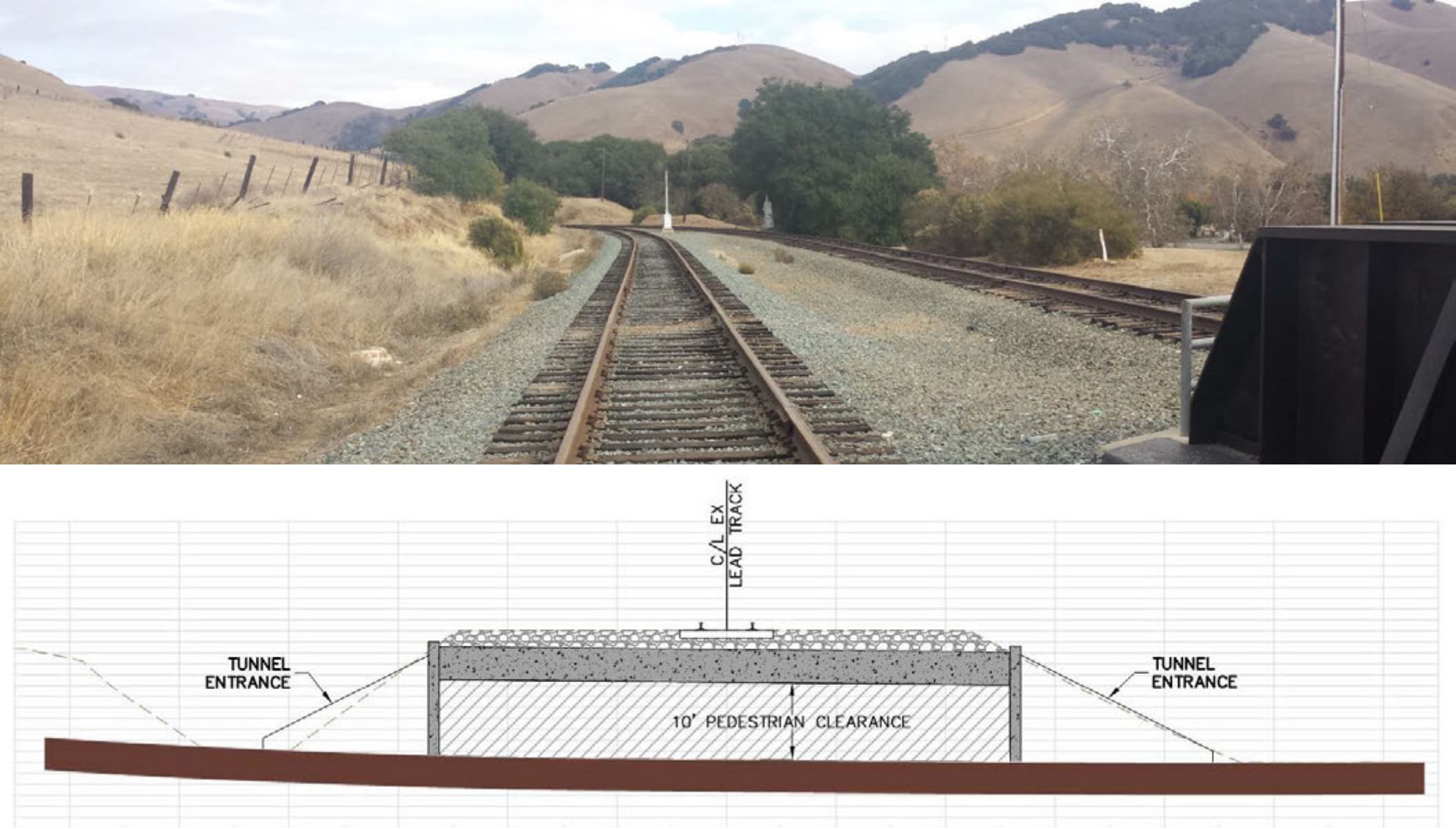


Figure 2-4 – Undercrossing Cross Section

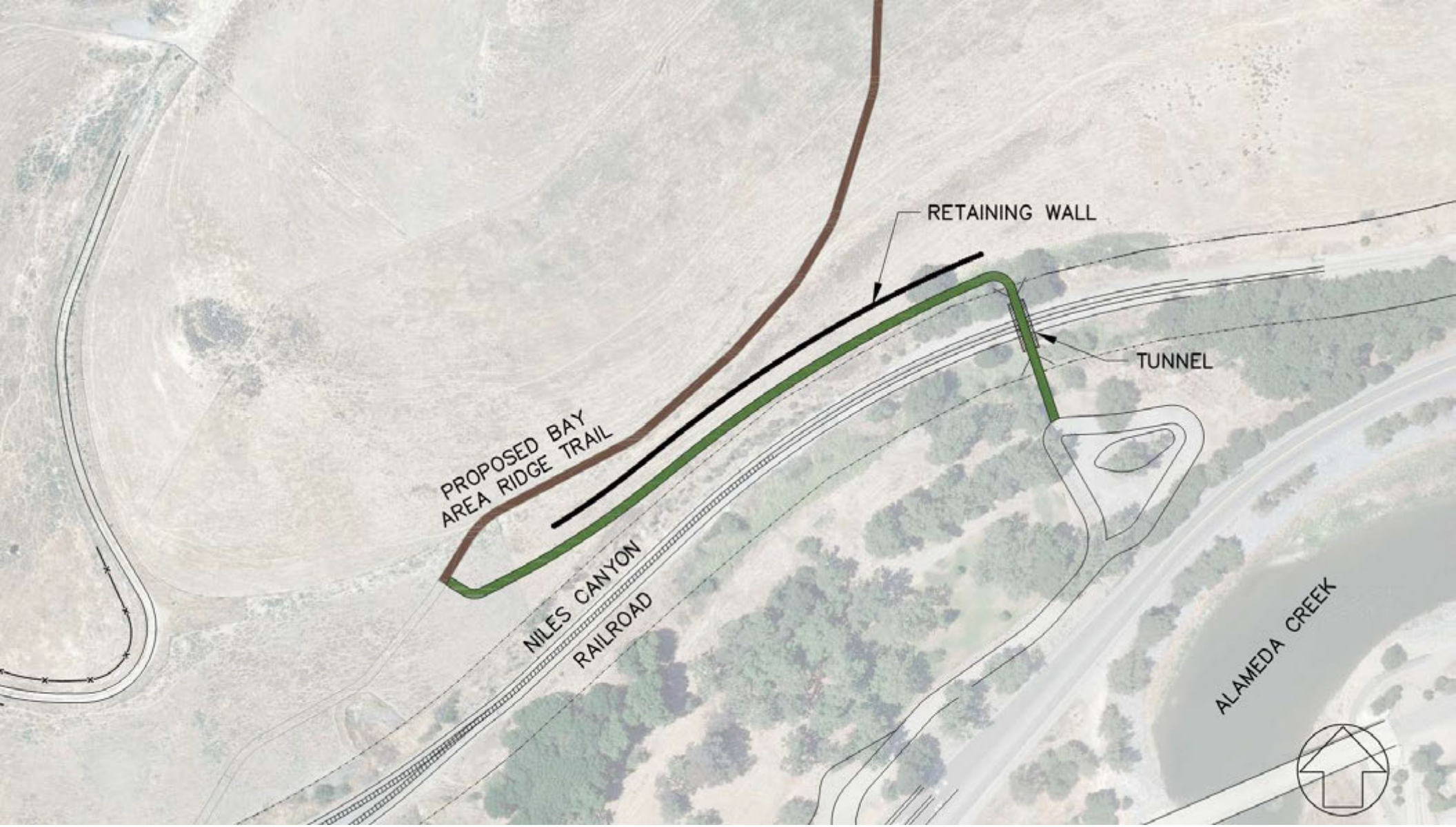
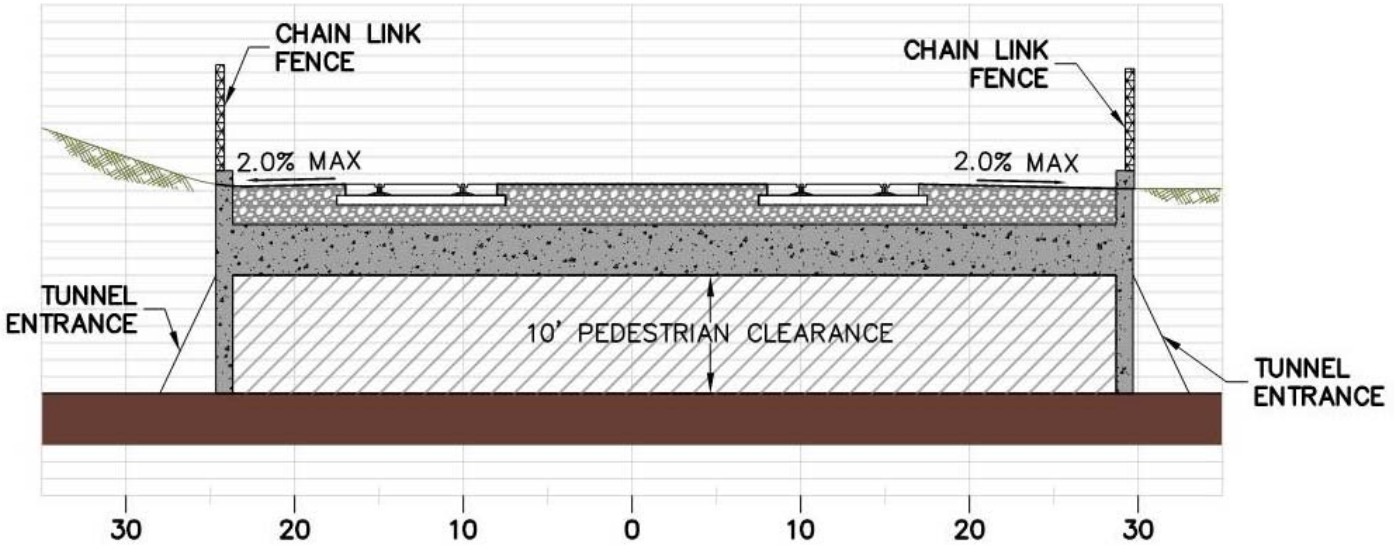
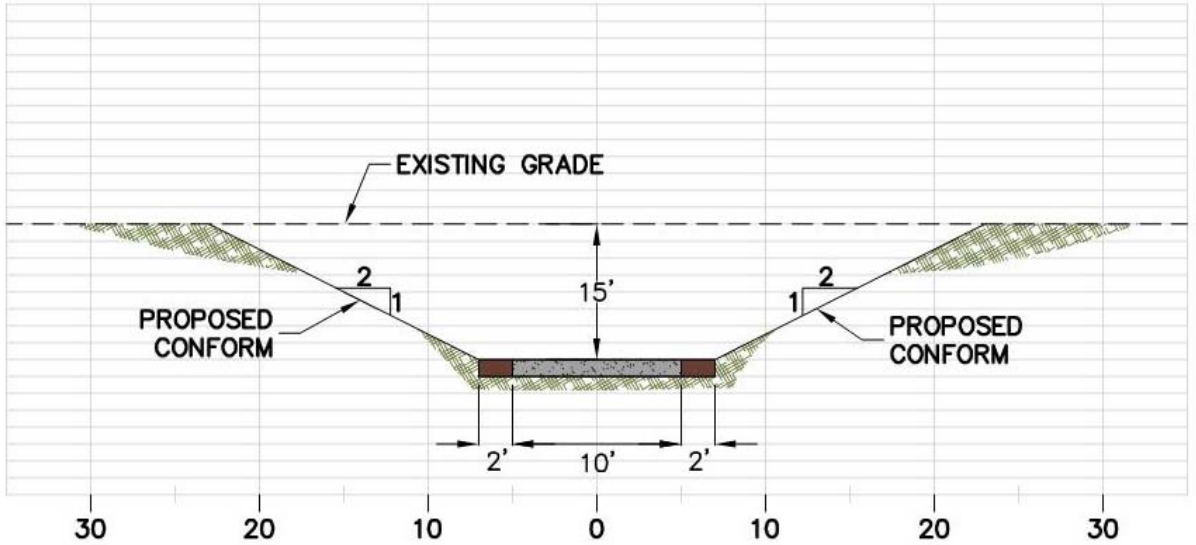


Figure 2-5 – Undercrossing Alternative



SECTION THROUGH TUNNEL
LOOKING EAST



SECTION THROUGH TUNNEL
APPROACH

Figure 2-6 – Undercrossing Alternative Section

Option 3 – Overcrossing. This option takes advantage of the higher terrain located to the north of the NCR spanning the tracks with a prefabricated bridge. As shown in Figures 2-7 and 2-8, this bridge would provide slightly more than 23 feet of clearance above the tracks featuring abutments on either side of the crossing. The crossing's location is as shown in Option 2 to minimize the bridge's span.

As the elevations slopes steeply downward to the west of the crossing, the option requires significant earthwork to transition using accessible compliant slopes to match the existing conditions requiring the installation of retaining walls (shown conceptual in black in Figure 2-7) south of the bridge. At a slope of 5%, the total length of transition could be up to 800 feet in length.

The work to construct an overcrossing would require earthwork to the north and south of the crossing as well as the installation of abutments and retaining walls. It will take about four months to construct this option requiring flagging during NCR operations while installing the abutments. For the one day required to install the bridge, NCR operations would be limited. The total cost to implement this option is about $3 million. The equestrian community found this option unfavorable. Due to the visibility of the bridge, retaining walls, and related grading, this option would likely have a potential visual impact under the California Environmental Quality Act.

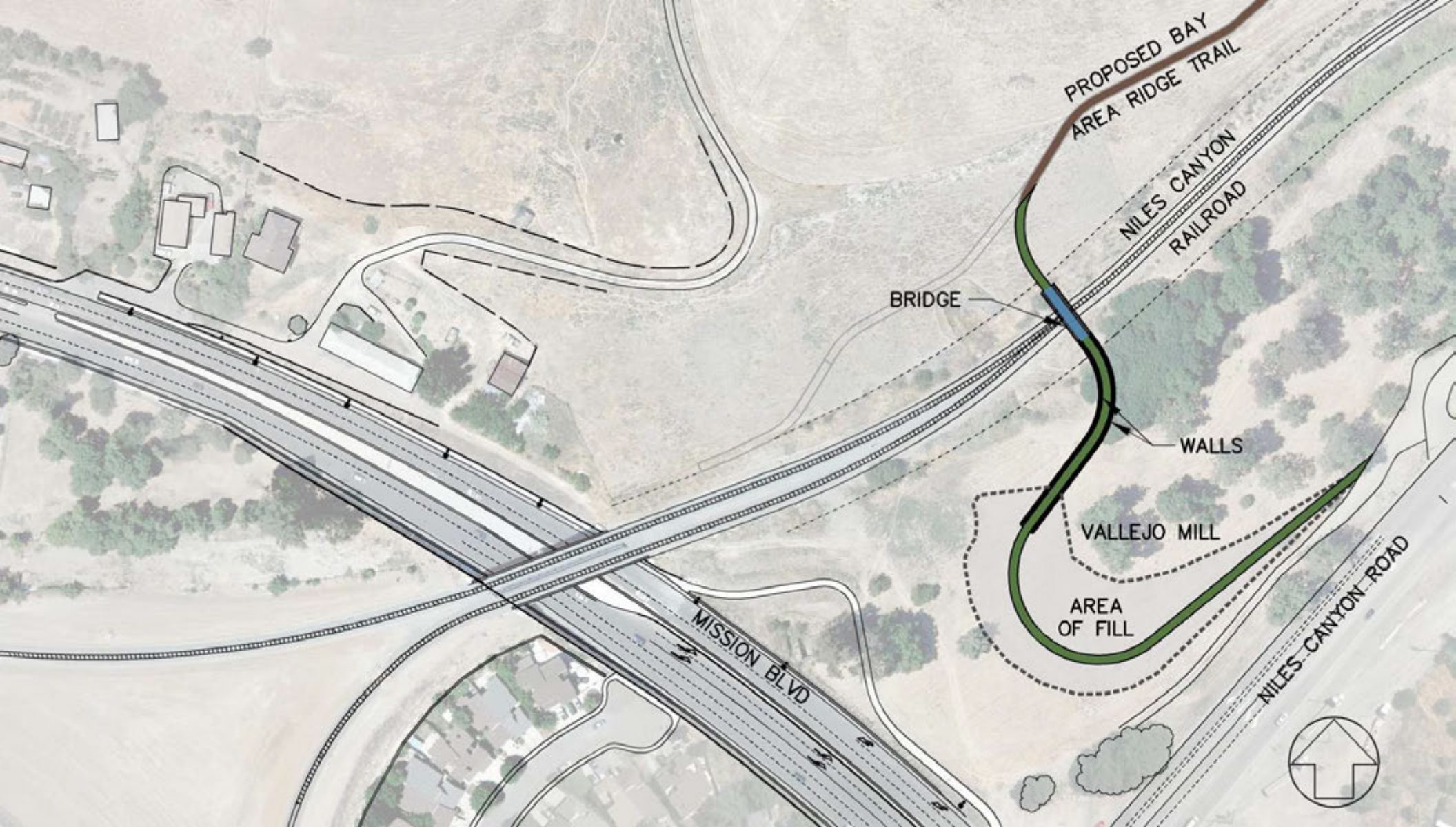


Figure 2-7 – Overcrossing

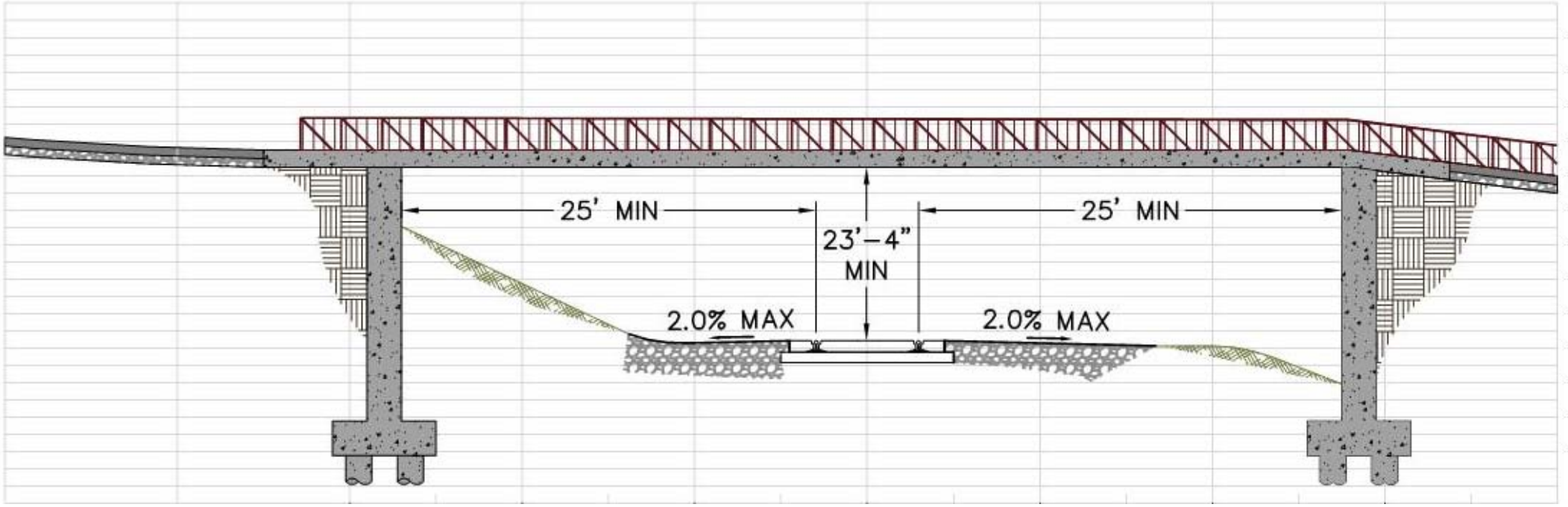


Figure 2-8 – Overcrossing Section

Recommendations and Next Steps. We recommend pursuing an at-grade crossing as described in Option 1 for the following reasons:

1. The available sight distance at the crossing meets the CPUC's guidelines
2. Both the speed and volume of train traffic is low
3. The volume of expected users on the future non-paved trail that is 48 inches wide is low
4. The option offers the lowest construction phase disruption to NCR
5. A bridge presents a visual impact under CEQA
6. A tunnel provides an undesirable user experience and safety concern
7. Both a bridge and tunnel create hazards for equestrian users
8. Both a bridge and tunnel represent long term maintenance costs
9. Feedback received from the community meeting indicated a preference for an at grade crossing
10. The costs of Options 2 and 3 are high

As it is unclear if California law precludes the construction of new at grade railway crossings and if approval by the CPUC is necessary, we recommend retaining legal counsel to review the condition. If CPUC approval is necessary, given the low volume of rail traffic, we suggest obtaining a temporary permit to accommodate the crossing with conditions for future modification should either freight of commuter rail begin using the corridor.

SEGMENT 3 – CONNECTION TO THE VARGAS PLATEAU

Introduction. The final trail segment includes a non-paved, multiuse link between the Sunol Water Temple and the Vargas Plateau, which is a new park under development by the District. The nearly 3-mile trail will be unpaved following existing roads rising approximately 900 feet as shown in Figure 3-1.

The trail up to the Vargas Plateau is a gradual ascent following a fire road.

At the easterly segment, the trail must cross Alameda Creek to reach the Water Temple. As shown in the Figure 3-2, the Federal Emergency Management District has mapped this segment of Alameda Creek within a high-risk flood zone resulting from a storm with a 100-year recurrence interval. Thus, to cross the creek, there are two potential options as illustrated in Figure 3-3.

We have located the proposed crossing locations in coordination with the future Sunol Water Temple Visitor's Center currently in planning by the SFPUC. Additionally, we placed the proposed crossing points to minimize the trail's slope as well as prevent tree removal. To avoid constructing abutments within the flood zone, the bridges have spans of over 300 feet. This span is too long to bridge using a conventional prefabricated bridge and may require piers placed within the creek.

The bridge options to cross the Alameda Creek are both located behind the Sunol Water Temple.

Rights of Way. While most of the proposed trail is located on public property, there are several private parcels affected.

Cost. Given that the spans are of equal length, the cost to construct either option is approximately $4.8 million.

Approvals. To construct this segment the EBRPD will need to secure grading permits from Alameda County. The District will need to secure approvals from the following regulatory agencies for construction of the pedestrian bridge:

- U.S. Army Corps of Engineers (Federal Clean Water Act [CWA] Section 404 Permit)
- Regional Water Quality Control Board (CWA Section 401 Water Quality Certification)
- U.S. Fish and Wildlife Service (possible Endangered Species Act Section 7 consultation or "Not Likely to Adversely Affect" concurrence)

Recommendations and Next Steps. To advance, the trail to the Vargas Plateau we recommend the following:

1. Confirm the extent of the flood zone of Alameda Creek with the SFPUC to define the location of bridge abutments
2. Conduct a topographic survey at the crossing location to define the location of abutments and length of bridge
3. Complete a field geotechnical exploration at the crossing to evaluate foundation options
4. Define the limit of regulatory agency jurisdictional limits of Alameda Creek
5. Secure easements for the trail through private properties
6. Complete a special-status plant survey
7. Complete plans for the trail and bridge
8. Complete and submit an application and plans for approval.

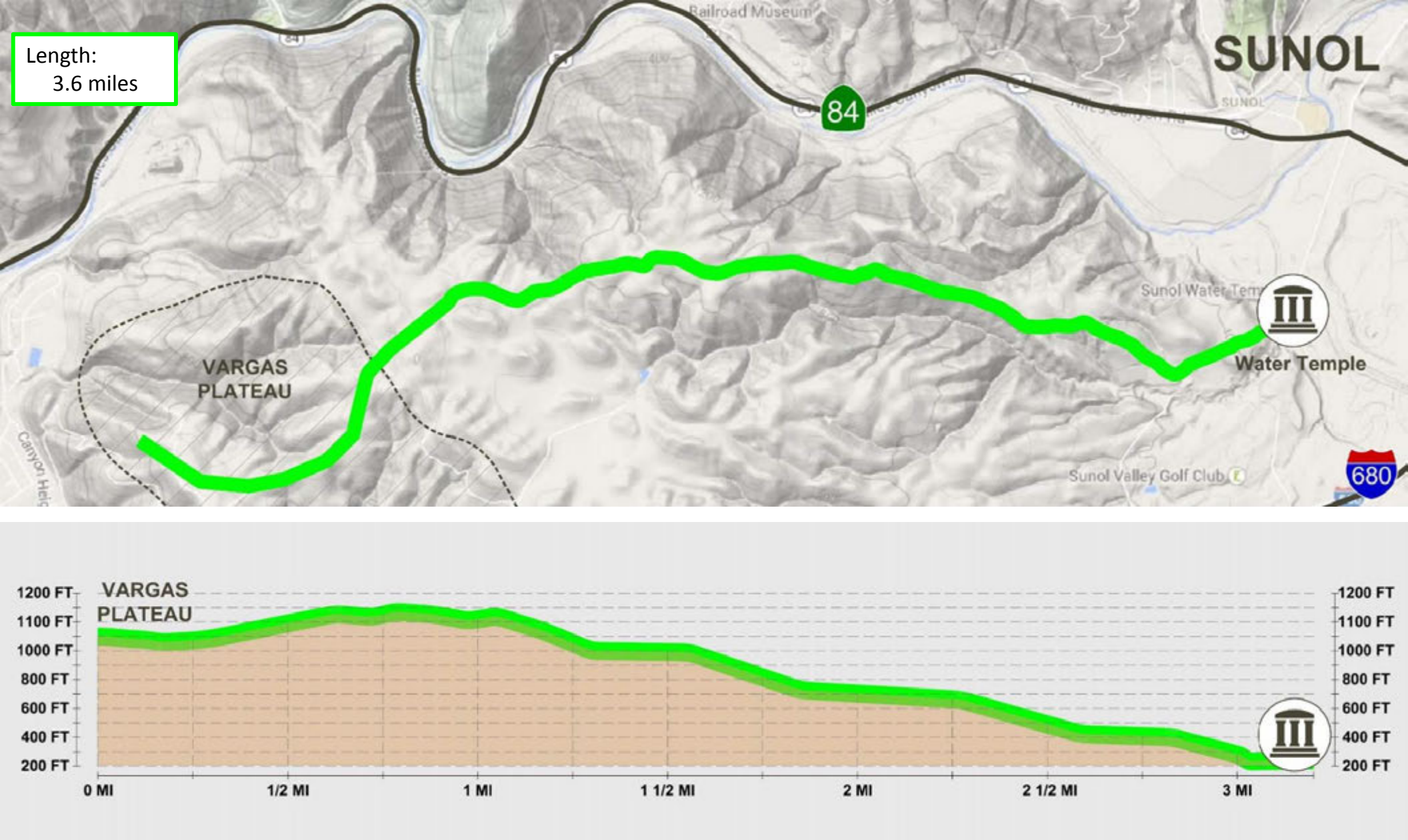


Figure 3-1 Vargas Plateau Trail Plan and Profile

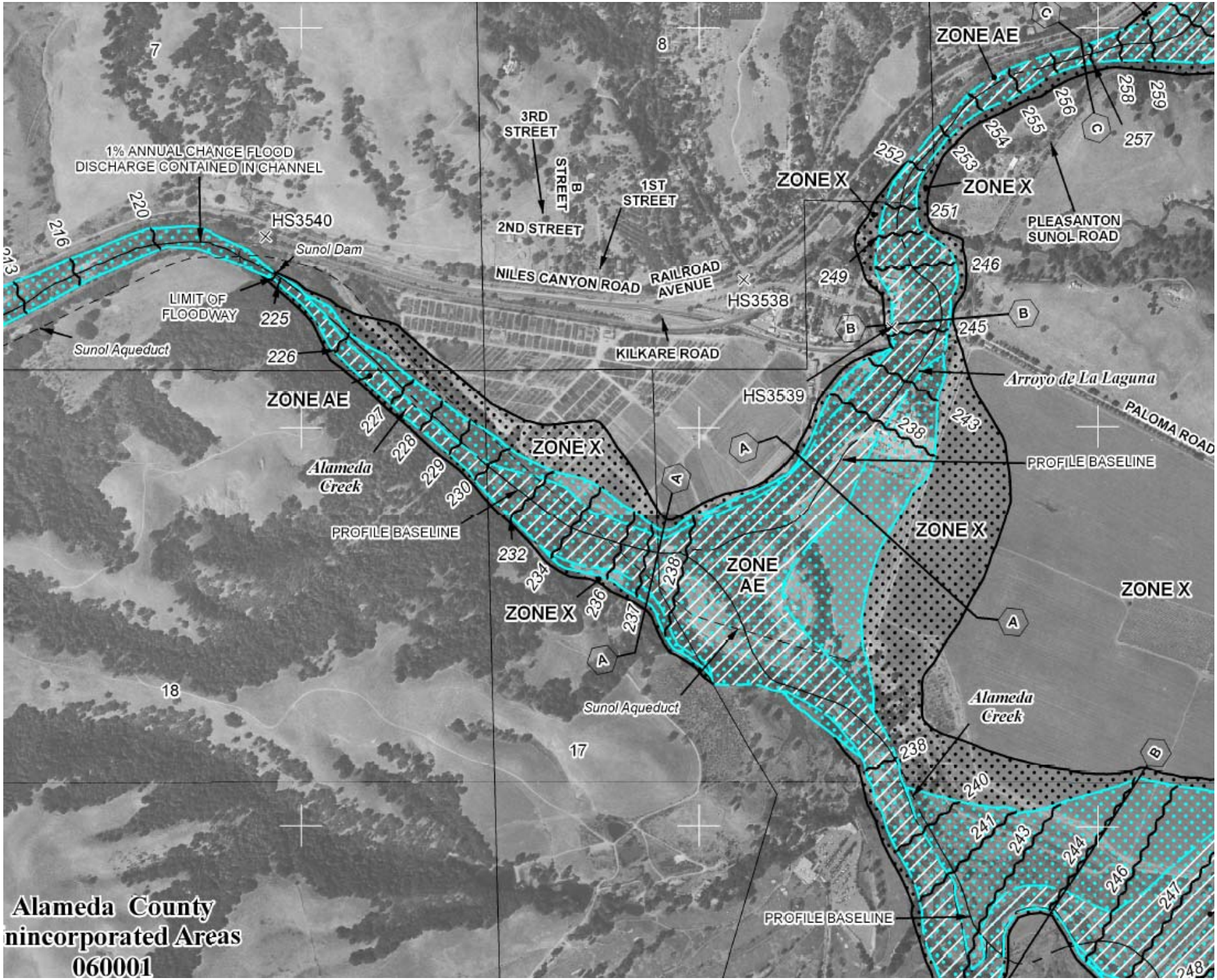


Figure 3-2 Alameda Creek Flood Limits

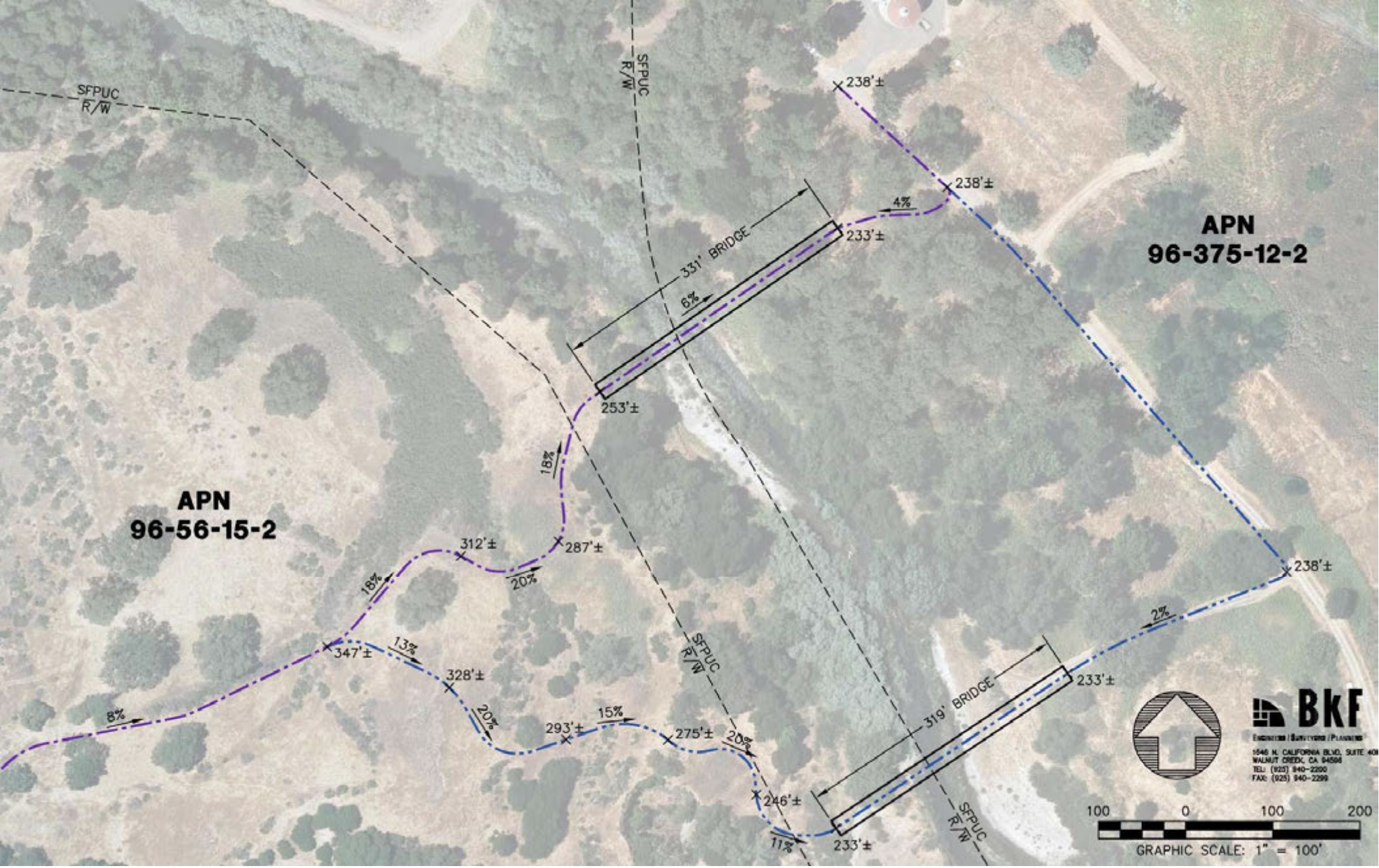


Figure 3-3 – Alameda Creek Bridge Options

CONCLUSION

Expanding trail access in Niles Canyon appears both complex and expensive. However, by using an iterative approach in evaluating options, leveraging existing infrastructure, and coordinating with other agencies within the Canyon, a trail is feasible. Similar to the Bay Trail or Ridge Trail, the Niles Canyon trail would be constructed in a series of phases. Based on the popularity of the October 2015 canyon tour, a trail between Niles and Sunol will receive significant public support.

APPENDIX A

Previously Recorded Cultural Resources

Resource Identifier	***Resource Description***
CA-ALA-565H/ P-01-000015	Archaeological site with prehistoric and historic-period components described as a possible village site with fragmented human remains. This resource has been assigned a National Register Status (NRS) code of 7, indicating that it has not been evaluated for the Nation Register of Historic Places (NRHP) or the California Register of Historic Resources (CRHR); or that it needs revaluation.
CA-ALA-000004/ P-01-000025	Prehistoric archaeological site previously –described as a "Village." No NRS code has been assigned to this resource.
CA-ALA-548H/ P-01-000227	Archaeological site with prehistoric and historic-period components, including exposed foundations of an 1856 mill. This site is referred to as the Vallejo Flour Mill and is listed as California Historical Landmark # 46.
CA-ALA-582H/ P-01-0022190	Historic-period archaeological site described as a portion of –the Western Pacific Railroad alignment. No NRS code has been assigned to this resource.
P-01-002191	Historic-period structure described as the State Highway 84/Alameda Creek Bridge. This resource was constructed in 1947 and has been assigned an NRS code of 3S and a Caltrans Historic Bridge Inventory Historical Significance ranking of 2, indicating that it appears eligible for NRHP. It is designated as Caltrans Bridge #33-0039.
CA-ALA-583H/ P-01-002192	Historic-period archaeological site described as the Sunol Aqueduct of Spring Valley Water Company. The resource was part of an Alameda Creek water conveyance system constructed in 1900 and has been assigned a NRS code of 2S2, indicating that it has been determined eligible for the NRHP by a consensus through the Section 106 process and is listed in the CRHR.
P-01-008189	Historic-period structure described as the Farwell railroad bridge and underpass, constructed in 1932. In 1994 this resource was given a NRS code of 6Y, indicating that it was determined ineligible for the NRHP by consensus through the Section 106 process, but not evaluated for the CRHR or local listing. The July 2015 Caltrans Historic Bridge Inventory, however, has assigned a historical significance ranking of 2, indicating that it appears eligible for the NRHP. It is designated as Caltrans Bridge #33-0035.
P-01-008190	Historic-period structure described the Rosewarnes underpass, constructed in 1906. In 1994, this resource was given an NRS code of 6Y, indicating that is was determined ineligible for the NRHP by consensus through the Section 106 process, but not evaluated for CRHR or local listing. The July 2015 Caltrans Historic Bridge Inventory, however, has assigned a historical significance ranking of 2, indicating that it appears eligible for the NRHP. It is designated as Caltrans Bridge # 33-0034
P-01-010209	Historic-period structure described as the Sunol Water Temple, constructed in 1910. This resource was given a NRHP status code of 3B, indicating it appears eligible for the NRHP both individually and as a contributor to a NRHP-eligible district through survey evaluation.
P-01-010778	Prehistoric archaeological site described as an isolated unifacial cobble with flake scars.
P-01-010797	Historic-period structure described as an isolated concrete bridge abutment located on the north side of Alameda Creek. This resource was assigned a NRS code of 7, indicating that it has not been evaluated for the NRHP or CRHR; or that it needs revaluation.
P-01-010798	Historic-period archaeological site described as an approximately two-mile-long alignment of abandoned telegraph poles. This resource was assigned a NRS code of 7,

Resource Identifier	***Resource Description***
	indicating that it has not been evaluated for the NRHP or the CRHR; or that it needs revaluation.
P-01-010801	Historic-period archaeological site described as two segments of State Route 84. This resource was assigned a NRS code of 7, indicating that it has not been evaluated for the NRHP or the CRHR; or that it needs revaluation.
P-01-010841	Historic-period building described as the Sunol Water Temple supervisor's dwelling, constructed in 1910. This resource was given a NR status code of 6Z, indicating that it was found ineligible for the NRHP, CRHR, and local listing through survey evaluation.
P-01-010961	Historic-period structure described as the Vallejo Mills/Sun Valley Water Conveyance System, constructed between1841-1900. This resource was evaluated in 2004 and considered eligible for the NRHP.
P-01-011357	Historic-period resource described as the Niles Canyon Transcontinental Railroad Historic District. This resource is listed in the NRHP and CRHR.
P-01-011452	Historic-period structure described as the Spring Valley Water Companies Water Conveyance System. This resource was assigned a NRS code of 3S, indicating that it appears eligible for the NRHP as an individual property through survey evaluation.
P-01-011455	Historic-period structure described as the Sunol Dam. This resource has been assigned a NRS code of 3, indicating that it appears eligible for the NRHP or CRHR through Survey Evaluation.
CA-ALA- 677H/ P-01-011540	Archaeological site with prehistoric and historic-period components. No NRS code has been assigned to this resource.

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Study Identifier	***Author, Title, and Year***
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S-000727	Miley Holman and David Chavez, *An Archaeological Reconnaissance of Two New Proposed Waste Water Pipeline Routes, Livermore-Amador Valley Water Management Agency, Alameda County, California,* 1977.
S-000814	Peter Banks and David A. Fredrickson, *An Archaeological Investigation of Project #3, Zone 5 and Zone 6 of the Alameda County Flood Control and Water Conservation District,* 1977.
S-000898	Edward Love, Miley P. Holman and David Chavez, *An Archaeological Reconnaissance of the Proposed Pipeline Routes and Reservoir Locations, Livermore-Amador Valley Water Management Agency, Alameda County, California,* 1976.
S-002607	David Chavez, *Alameda County Water District's Groundwater Recharge Facilities Plan*, 1981.
S-002811	Mara Melandry, *Archaeological Survey Report for Sale of an Excess Parcel Near Sunol, Alameda County, 04-Ala-84 P.M. 17.00 4402-911033, Excess Parcel 6979-01-01*, 1981.
S-007181	Public Anthropological Research, *Cultural Resources Investigations, Bay Area Teleport Project, Niles Canyon, Alameda County, California,* 1995.
S-007663	Miley Paul Holman *Mission Clay Projects Archaeological Reconnaissance,* 1985
S-008739	Archaeological Resource Management, *Cultural Resource Evaluation of the Proposed Pacific Locomotive Association Railroad Museum in the Niles Canyon Transportation Corridor, County of Alameda*, 1986.
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Study Identifier	Author, Title, and Year
S-011396	BioSystems Analysis, Inc., *Technical Report of Cultural Resources Studies for the Proposed WTG-WEST, Inc., Los Angeles to San Francisco and Sacramento, California: Fiber Optic Cable Project,* 1989.
S-012961	Margret Buss, *Archaeological Survey Report for Replacement of Bridge No. 33C-07 Over Sinbad Creek on Kilkare Road, P.M. 0.24,in Sunol, Alameda County*, 1982.
S-013554	Allen G. Pastron, *Vallejo Mills Historic Park, Archaeological Testing Program,* 1986.
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S-14671	Richard Ambro, *Report of Archival Research to Identify Potential Historic Cultural Resources in the Mission Valley Rock Project Area, Sunol, Alameda County*, California, 1992.
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S-018294	Colin Busby, *Surface Mining Permit at Niles Canyon Quarry, Vicinity of Sunol, Alameda County, California, Cultural Resources Assessment*, 1995.
S-021035	Sunshine Psota, *Review of Historic Resources for Site PL-162-01, Approximately 1/8 Mile Northeast of Stenhammer Road, Fremont, Alameda County, CA (50001 83/98)*, 1998.
S-022543	Andrew Hope, Elizabeth Krase, and Elizabeth Mckee, *Historic Property Survey Report for the Seismic Retrofit of Alameda Creek Bridge and Overhead (Bridge #330039), Alameda County, 04-ALA-84-PM 14.32, EA 14670K,* 1998.
S-022820	Wendy J. Nelson, Tammara Norton, Larry Chiea, and Eugenia Mitsanis, Cultural Resources Survey for the Level (3) Communications Long Haul Fiber Optics Project, Segment WS07: Oakland to San Jose, 2000.
S-022996	Miley Paul Holman, *Archaeological Field Inspection of the Proposed Stratos Mobile Comm Wireless Base Site, 38000 Palomares Road, Niles Canyon, Alameda County, California,*1999.
S-024041	Brian Hatoff, Alex Wesson, and Stephen D. Mikesell, *Historic Property Survey Report, Archaeological Survey Report, Bridge Evaluation, and Attachments, Old Canyon Road Bridge Seismic Retrofit Project, Bridge 33C-17,* 2000.
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S-031536	Allen Pastron, Anna Engberg, and Emily Wick, *Final Draft Archaeological Research Design and Treatment Plan: Niles Dam Removal, Niles Canyon, Alameda County, California,* 2006.
S-031996	Meg Scantlebury, *Historic Property Survey Report, State Route 84 (Niles Canyon), Rosewarnes Underpass to Farwell Underpass (aka Dresser Bridge to Farwell Bridge) Safety Improvements, Alameda County, 04-ALA-84, KP 19.5/21.4 (PM 12.1/13.3), EA 04-174400,* 2004.
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S-033511	Laura Leach-Palm, Patricia Mikkelsen, Jerome King, Paul Brandy, Lindsay Hartman, and Bryan Larson, *Cultural Resources Inventory of Caltrans District 4 Rural Conventional Highways in Alameda, Marin, Napa, San Mateo,Santa Clara, and Sonoma Counties*, 2007.
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S-035518	Allen G. Pastron and Richard D. Ambro, *Final Report on Archaeological Monitoring of the Demolition of Niles Dam, Fremont, Alameda County, California*, 2007.
S-036481	Adrian Whitaker, Phil Kaijankowski, Jack Meyer, and Brian Byrd, *Archaeological Survey Report for the Dumbarton Rail Corridor Project, San Mateo and Alameda Counties, California,* 2009.
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