Mill Valley to Corte Madera

Bicycle and Pedestrian Corridor Study

Appendix F:

Environmental Considerations Study

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Environmental Considerations Study

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Environmental Considerations Study

LSA Associates prepared a preliminary environmental study, including background research and biological and cultural resources field surveys to identify potential significant adverse impacts to environmental resources that could occur along the three alternative routes. LSA obtained and reviewed all available documents pertaining to the bike and pedestrian corridor and conducted field visits to identify potential environmental issues and constraints. LSA conducted a biological resources assessment to identify any significant adverse impacts to biological resources and special status species using available material; obtained a list of special status species from the U.S. Fish and Wildlife Service (USFWS); and queried the California Natural Diversity Data Base and California Native Plant Society Online Database. LSA also conducted a cultural resources study consisting of a records search of the project area, a literature and cultural resources inventory review, a pedestrian survey, and consultation with the Native American Heritage Commission (NAHC). LSA prepared this analysis to document the background research, study methods, research findings, and field findings. The analysis also identifies any additional studies/surveys that may be required.

1.0 Biological Resources Analysis

LSA conducted a site visit on February 3, 2009 to determine potential biological constraints within each of the proposed Mill Valley to Corte Madera bike routes. Vegetation types, habitats, potential wetlands, and drainage features were noted on field maps. Prior to conducting the site visit, LSA reviewed the proposed bike alignments, aerial photography, and USGS topographic maps in order to identify possible constraints and issues related to the bike routes. LSA also searched the California Natural Diversity Database (CNDDB) for records of special-status species occurrences within five miles of the proposed bike routes. The species list from this search was reviewed to determine which species could potentially occur in the vicinity of the proposed bike routes.

The following paragraphs provide an overview of the habitats found along each of the proposed bike routes. A summary of potential biological constraints, including regulatory issues, is also provided. A brief discussion of special-status species can be found in Section 1.2.

1.1 Overview of Study Routes and Potential Constraints

Tamalpais Drive and Tamal Vista Boulevard

Tamalpais Drive, which connects the Camino Alto and Alto Tunnel routes to Tamal Vista Boulevard, is urbanized, consisting of residential and commercial areas as well as a park/playing fields. Similarly, areas along Tamal Vista Boulevard consist of residential areas to the west and commercial and office space to the east with limited biological resources. There is a bike/pedestrian path west of Wornum Way (at its intersection with Tamal Vista Boulevard). Vegetation along Tamalapais Drive and Tamal Vista Boulevard

consists primarily of ornamental trees, shrubs, and herbaceous plants. Trees present are redwood, pine, and Magnolia (*Magnolia* sp.), among others.

Potential Constraints: There do not appear to be any potential biological constraints associated with Tamalpais Drive or Tamal Vista Boulevard. Two drainages in the vicinity of Tamalpais Drive enter culverts before reaching the road and no culverts were observed on Tamal Vista Boulevard.

Meadowsweet Drive/Casa Buena Drive (Along U.S. 101)

The Meadowsweet Drive portion of this route includes commercial and residential areas. The flatter sections of the route, closer to Tamalpais Drive, include a library and apartment complexes; the more hilly sections are generally dominated by single family homes set in redwood (*Sequoia sempervirens*) and bay (*Umbellularia californica*) forest. One drainage is present in this portion of the route. The drainage is located west of Meadowsweet Drive and enters a storm drain at the road. The area immediately surrounding the drainage is dominated by blackberry (*Rubus* sp.). Other vegetation present along this section of Meadowsweet Drive is English ivy (*Hedera helix*), maidenhair fern (*Adiantum capillus-veneris*), dogtail grass (*Cynosurus echinatus*), clover (*Trifolium* sp.), geranium (*Geranium* sp.), and annual grasses.

Closer to the freeway, on Casa Buena Drive, more non-native/invasive vegetation is present, including fennel (*Foeniculum vulgare*), pampas grass (*Cortedaria jubata*), eucalyptus (*Eucalyptus* sp.), acacia (*Acacia* sp.), and scotch broom (*Cytisus scoparius*), as well as pine trees (*Pinus* sp.) and typical weedy roadside vegetation, including non-native annual grasses. The northern end of Casa Buena Drive is primarily a commercial area with a restaurant, car dealer, bank, coffee shop, and other commercial areas as well as some residential areas.

Potential Constraints: The drainage flowing west of Meadowsweet Drive may pose a possible constraint, as may a few Redwood trees located at the edge of the road. Any widening of the road in these areas would result in damage and/or removal of these trees. Any construction within or adjacent to the drainage may require regulatory permits.

Alto Tunnel

North Entrance. The north entrance of the Alto Tunnel is accessed via an existing pedestrian trail that begins near the old town square along Montecito Drive. The pedestrian trail is dominated by a mix of forbs and grasses as well as native and ornamental trees and shrubs. Herbaceous vegetation includes annual grasses, geranium, pampas grass, fennel, English ivy, dogtail grass, clover, bristly ox-tongue (*Picris echioides*), Bermuda butter-cup (*Oxalis pes-caparae*), periwinkle (*Vinca major*), milk thistle (*Silybum marianum*) and other common and/or weedy plants. Shrubs and trees present include acacia, blackberry, pine, coast live oak (*Quercus agrifolia*), cotoneaster (*Cotoneaster* sp.), and crimson bottle brush (*Callistemon citrinus*).

A channel is present towards the southern end of the pedestrian trail, approximately 10 to 30 feet west of the trail. The north end of the channel is relatively natural in appearance and is located just south of a Marin Municipal Water District pump house or similar

(unknown/unmarked) structure. It was not clear whether the channel entered a culvert (the area was overgrown with blackberry). Further south the channel narrows to 1 foot in width and continues south.

The pedestrian trail becomes more wooded as it nears the old tunnel entrance and the narrow channel widens into a seasonal wetland/channel. Woody vegetation present includes alder (*Alnus* sp.) and willow (*Salix* sp.) as well as poison oak (*Toxicodendron diversiloba*). Wetland vegetation present includes flatsedge (*Cyperus* sp.), rush (*Juncus* sp.), and curly dock (*Rumex crispus*). The trail then meanders into the seasonal wetland and continues south to the tunnel entrance that is surrounded by standing water. There did not appear to be a natural drainage feeding the wetland/channel along the pedestrian path. The area is more representative of a wetland basin since there does not appear to be an inflow or outflow. Water sources would be limited to runoff and seepage.

South Entrance. Beginning at Vasco Court, the proposed bike route follows a dirt path that is located just west of a stream channel and east of residential development. Narrow wetland areas are present to the west and east of the path. Moving towards the tunnel entrance, the areas within and surrounding the proposed bike route become wetter with ruderal vegetation (geranium, clover, bristly ox-tongue, teasel, pampas grass, annual grasses, dandelion [*Taraxacum officinale*], etc.) transitioning to more wetland vegetation (rush, flatsedge, cattail [*Typha* sp.], and watercress [*Rorippa nasturtium aquatica*]). Coast live oak, pine, and blackberry are also present and the area east of the trail is dominated by riparian vegetation.

Potential Constraints: At the north tunnel entrance the primary constraint is a large seasonal wetland/channel to the west of the existing pedestrian trail. It would be difficult to avoid this wetland without significant grading to the east of the trail, which is steep in places, and removal of mature stands of alder trees. In areas closest to the tunnel entrance, it appears impossible to avoid the wetland due to the steepness of the slopes and narrow work area. Similarly, much of the area at the south tunnel entrance is seasonal wetland that most likely connects to the adjacent creek and would most likely be considered jurisdictional by the U.S. Army Corps of Engineers (Corps).

Edna Maguire Elementary School (Lomita Drive to Existing Bike Path)

An existing paved path connects Lomita Drive with another bike path west of Edna Maguire Elementary School. This connection currently crosses the elementary school parking lot. Re-alignment of the path to the immediate south may be feasible. The area between the existing paved path and the residential area to the south is dominated by weedy vegetation including ivy, fennel, blackberry, geranium, broom, bristly ox-tongue, curly dock, wild radish, and vetch (*Vicia* sp.). Eucalyptus saplings, a coast live oak shrub/sapling, and a mature California buckeye (*Aesculus californica*) were also present. A creek daylights approximately 25 feet west of the existing paved path.

Potential Constraints: A coast live oak and buckeye are present at the top of the hill and could be impacted by re-alignment of the bike path. The presence of a creek channel to the

west of the paved path could pose some constraints but it appears to be outside the area where the bike path re-alignment would occur.

Camino Alto/Corte Madera Avenue

A significant portion of the area west of Camino Alto/Corte Madera Avenue is located within Marin County Open Space District lands and, as such, is relatively undisturbed compared to surrounding residential areas dominated by ornamental plants and landscaped areas. Much of the Camino Alto/Corte Madera Avenue corridor is dominated by redwood and bay trees as well as other native herbaceous vegetation including ferns and miner's lettuce (*Claytonia perfoliata*). Ruderal/weedy vegetation including broom, thistle, and acacia is present in some places at the edges of the road. Approximately eight drainages flow from the hillsides west of Camino Alto/Corte Madera Avenue and enter culverts under the road. These drainages vary in size, but are generally narrow and appear to be ephemeral.

Potential Constraints: Several redwood trees are located immediately adjacent to the existing pavement; any widening in these areas would impact these trees. Minor impacts to the drainages west of Camino Alto could occur due to widening (and may require a Corps permit depending on a jurisdictional determination).

1.2 Special-Status Species

Many of the special-status animals known to occur within five miles of the proposed bike routes rely on salt marsh and/or estuary habitat. None of the proposed bike routes traverse these habitat types; therefore, there are no major concerns regarding these species (*i.e.*, salt marsh harvest mouse [*Reithrodontomys raviventris*], California clapper rail [*Rallus longirostris obsoletus*], and San Pablo song sparrow [*Melospiza melodia samuelis*]) even though they are known to occur in the vicinity of the proposed bike routes. Western pond turtle (*Actinemys marmorata*), a California species of concern, could potentially occur in the drainages located near some of the proposed bike routes. Hoary bat (*Lasiurus cinereus*) and pallid bat (*Antrozous pallidus*) are known to occur within five miles of the bike routes. These species could potentially roost in the Alto tunnel if there are any existing available openings into the tunnel. At present, it is assumed that the tunnel has been completely closed off at both entrances, but this was not verified.

Several special-status plant species occur within five miles of the proposed bike routes. A more thorough review of the CNDDB search results is required to determine the likelihood of occurrence along any of the proposed bike routes. LSA recommends that a rare plant survey be conducted prior to any final decisions regarding the proposed bike routes.

1.3 Trees Potentially Affected

LSA conducted a site visit on April 30, 2009 to determine the approximate number and size of each tree species that would be potentially impacted by rehabilitation measures at the

north and south Alto Tunnel entrances. Results of the tree inventory are provided in Tables A and B below.

Trees listed in Table A are located within the area approximately 20 ft west of the trail leading to the north entrance and immediately adjacent to the trail on the east side. Table A also includes trees located within the turnaround area depicted on the map entitled "*Alto Tunnel Conceptual Rehabilitation Portal Development*" (Jacobs Associates Engineers/Consultants, December 2008).

Table A. Trees Potentially Impacted at the North Entrance

Species	Age/Size	
	Mature[1]	Young[2]
Native Species		
California Bay (*Umbellularia californica)*		2
Coast live oak (*Quercus agrifolia*)	1	6
Arroyo willow (*Salix lasiolepsis*)	15	6
Subtotal Native Species	**16**	**14**
Non-native/Ornamental Species		
Acacia (*Acacia* sp.)	9	4
Elm (*Ulmus* sp.)	31	17
Plum (*Prunus* sp.)	1	
Unknown Native Status		
Ash (*Fraxinus* sp.)	3	9
Hawthorne (*Crataegus* sp.)	1	
Pine (*Pinus* sp.)	2	
Unknown	2	
Subtotal Non-native/Ornamental Species or Unknown	**49**	**30**
TOTAL	**65**	**44**

Trees listed in Table B are located within approximately 10 ft east or west of the existing pedestrian path and/or within the proposed turnaround area near the south entrance. The tree inventory includes an approximation of the number of trees between the proposed turnaround and the south tunnel entrance.

Table B. Trees Potentially Impacted at the South Entrance

Species	Age/Size	
	Mature[1]	Young [2]
Native Species		
Coast live oak (*Quercus agrifolia*)	15	5
Arroyo willow (*Salix lasiolepsis*) and red willow (*S.*	13	18
TOTAL	**28**	**23**

[1] Tree counts include trunk only; potential damage to tree canopy/roots not included
[2] Generally less than 6 inches diameter at breast height (DBH)

2.0 Cultural Resources Analysis

2.1 Cultural Resources Study

In March, 2009, LSA conducted a cultural resources study, as described below, to address archaeological and architectural resource constraints for the three alternatives.

Records Search

On February 17, 2009, LSA conducted a records search (File #08-0956) of the project area and a 500-foot radius at the Northwest Information Center (NWIC) of the California Historical Resources Information System, Sonoma State University, Rohnert Park. The NWIC is the official state repository of cultural resource records and reports for Marin County. As part of the records search, the following federal and State of California inventories were reviewed:

- *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, November 10, 2008). The directory includes the listings of the National Register of Historic Places, National Historic Landmarks, the California Register of Historical Resources, California Historical Landmarks, and California Points of Historical Interest.

The record search identified three archaeological sites and six architectural resources within or adjacent to the project area.

Archaeological Sites within the Project Area:

Camino Alto/Corte Madera Avenue Alternative.

- P-21-0000678. Prehistoric shell midden.

Alto Tunnel Alternative.

- CA-MRN-500/P-21-0000447. Prehistoric shell midden.

Lomita-U.S. 101 Path-Meadowsweet Drive Alternative.

- CA-MRN-065/P-21-0000095. Prehistoric shell midden *Architectural Resources Adjacent to the Proposed Project Area:*

Camino Alto/Corte Madera Avenue Alternative.

- 425 Corte Madera Avenue.

- 346 Corte Madera Avenue.
- 216 Corte Madera Avenue.
- 160 Corte Madera Avenue.

Camino Alto/Corte Madera Avenue Alternative and the Alto Tunnel Alternative.

- 315 Tamalpais Drive.

Lomita-U.S. 101 Path-Meadowsweet Drive Alternative.

- P-21-0000730. Historic residential property.

Archaeological Sites within 500 Feet of the Project Area.
Alto Tunnel Alternative.

- CA-MRN-011/P-21-0000042. Prehistoric shell midden.
- CA-MRN-012/P-21-0000043. Prehistoric shell midden.
- CA-MRN-499/P-21-0000446. Prehistoric shell midden.

Camino Alto/Corte Madera Avenue Alternative and the Alto Tunnel Alternative.

- CA-MRN-066/P-21-0000096. Prehistoric shell midden.

Lomita-U.S. 101 Path-Meadowsweet Drive Alternative.

- P-21-0000679. Prehistoric shell midden.

Literature Review

LSA reviewed the following publications, maps, and websites for archaeological, ethnographic, historical, and environmental information about the project area and its vicinity:

- *California Place Names* (Gudde 1998);
- *Historic Spots in California* (Hoover et al. 1990);
- *Handbook of the Indians of California* (Kroeber 1925);
- Coast Miwok in *Handbook of North American Indians* (Kelly 1978);
- *Map of San Francisco Bay Region Showing Distributions of Shell Heaps* (Nelson 1909);
- *Geologic Map of the San Francisco-San Jose Quadrangle* (Wagner, Bortugno, and mcJunknin 1990);
- *Mount Tamalpais, Calif.*, 15-minute topographic quadrangle (USGS 1897);
- *Mount Tamalpais, Calif.*, 15-minute topographic quadrangle (USGS 1941);
- Safe Routes Marin Website (2000)

Nelson's (1909) shellmound map depicts the locations of prehistoric shell mounds generally at the marsh-dry land interface and along waterways. Nelson's (1909) map depicts approximately five shell mounds in and adjacent to the project areas, indicating high sensitivity for prehistoric cultural resources.

Additional internet research identified the Alto Tunnel, which runs between Mill Valley and Corte Madera under Alto Hill, as a cultural resource (Safe Routes Marin 2000). The tunnel is oriented along the historic alignment of the Northwestern Pacific Railroad. Two dates are embossed at the top of the concrete portal: 1884, when the tunnel was built, and 1956, when it was upgraded.

Native American Consultation

On February 11, 2009, LSA Associates, Inc. (LSA), sent a letter describing the project with maps depicting the project area to the Native American Heritage Commission (NAHC) in Sacramento asking the Commission to review their Sacred Lands File for Native American cultural resources that might be affected by the proposed project. Ms. Katy Sanchez, NAHC program Analyst, replied in a fax dated February 24, 2009, that a review of the Sacred Lands File does not indicate any "Native American cultural resources in the immediate project area"

Pedestrian Survey

LSA archaeologist Heather Blind conducted a mixed-strategy pedestrian survey of the project area on February 25, 2009. Areas identified by the records search as archaeologically sensitive and areas that prehistoric populations might have utilized for habitation or resource processing locations (e.g., terraces and areas near water) were surveyed. Areas determined to not be archaeologically sensitive, consisting of moderately-steep slopes, were cursorily inspected. One area could not be accessed due to flooding. Small areas of soil surface were regularly scraped clear of obstruction and examined for possible archaeological deposits. The survey was documented with field notes, photographs, and maps.

Results of Field Survey

Areas where cultural resources were identified by the records search were field reviewed. The results are presented below:

Camino Alto/Corte Madera Avenue Alternative.

- P-21-0000678. The records search identified this prehistoric archaeological site east of the project area (Camino Alto). Midden soils and fragments of shell were identified during LSA's pedestrian survey approximately 20 to 30 feet southeast of Camino Alto. The site may extend northwest into the project area beneath alluvial soils.

Alto Tunnel Alternative

- CA-MRN-500/P-21-0000447. The records search identified this prehistoric archaeological site north of Vasco Road and south of Lower Drive. The location of the prehistoric site could not be confirmed as the project area was inaccessible due to flooding. Camino Alto/Corte Madera Avenue Alternative and the Alto Tunnel Alternative.
- 425 Corte Madera Avenue, 346 Corte Madera Avenue, 216 Corte Madera Avenue, 160 Corte Madera Avenue and 315 Tamalpais Drive. These historic residences are all located in or close to Old Corte Madera Town Square, a historic part of Corte Madera.

Lomita-U.S. 101 Path-Meadowsweet Drive Alternative.

- CA-MRN-065/P-21-0000095. The records search identified this prehistoric archaeological site directly adjacent to Meadowsweet Drive. The site was not identified during the pedestrian survey. Visibility was extremely limited as the area has been developed and soil visibility was limited to landscaped areas. Buried components of the site could exist below the roadway;
- P-21-0000730. The records search identified this historic residential property at the south end of Casa Buena Drive, north of Meadow Valley Lane. The building is approximately 40 feet east of Casa Buena Drive.

The following additional cultural resources were identified during the pedestrian survey:

Camino Alto/Corte Madera Avenue Alternative.

- Three board-molded, concrete culverts (ca. 1930 to 1950) (one is a pipe culvert) at drainages along Camino Alto;
- One poured-in-place water conveyance channel (unknown age) on Camino Alto;
- One concrete slab retaining wall (unknown age) on Camino Alto; and
- Remnants of wooden post and barbed wire fencing along Camino Alto.

Camino Alto/Corte Madera Avenue Alternative and the Alto Tunnel Alternative.

- Menke Park (established 1916) is adjacent to the proposed project area in Old Corte Madera Town Square.

Alto Tunnel Alternative.

- In the area of the historic Alto Tunnel (north end) fragments of milk glass and old fence posts were identified around the tunnel entrance. Access in this area was limited due to flooding and additional historic artifacts/deposits may be present.

Lomita U.S. 101 Path-Meadowsweet Drive Alternative.

- Meadowsweet Dairy (established 1926) at 811 Meadowsweet Drive was identified as containing historic buildings. The dairy buildings are currently used as apartments and as artists' studio; exhibition space, and center of operations for a collaborative artist group known as Meadowsweet Dairy.

Camino Alto/Corte Madera Avenue Alternative, Alto Tunnel Alternative and Lomita-U.S. 101 Path Meadowsweet Drive Alternative.

- The field review identified historical residences along Camino Alto, Tamalpais Drive, Montecito Drive (parallels current pedestrian/bike path), Redwood Avenue, Meadowsweet Drive, and Tamal Vista Boulevard were identified as historic.

Paleontological Resources

A fossil locality search of the project area and a 10-mile radius was conducted at LSA's request on February 11, 2009, by Dr. Pat Holroyd of the University of California Museum of Paleontology (UCMP), Berkeley. The purpose of this search was to (1) identify previous studies and known paleontological sites within and near the project area; and (2) identify the geologic formations and types of fossils that might be expected within and adjacent to the project area based on the existing geological and paleontological data.

There are no recorded fossil localities within or adjacent to any of the project area alternatives.

Geological deposits within the project area consist of the following geological units, described in stratigraphic sequence from youngest (top) to oldest (bottom):

Holocene Bay Mud. Helley et al. (1979) describe this estuarine bay mud in the project area as plastic clay and silty clay rich in organic material. These deposits contain fresh- and brackish-water gastropod and pelecypod shells of extant, modern taxa (Helley et al. 1979) that are generally not considered paleontologically significant. These deposits are generally as much as 10 feet thick.

Pleistocene Alluvium. Likely underlying the Holocene estuarine bay mud in the project area north of Tamalpais Drive are Late Pleistocene (126,000 to 10,000 years B.P.) alluvial deposits (Helley et al. 1979; Wagner and Bortugno 1999). Late Pleistocene sediments in the Bay Area are known to contain such significant Rancholabrean land mammal (300,000 to 10,000 years B.P.) vertebrate fossils, as ground sloth, dire wolf, saber-toothed cat, camel, bison, mammoth, horse, rodent, bird, reptile, and amphibian fossils (Bell et al. 2004; Savage 1951; Stirton 1951).

Mesozoic Franciscan Formation. Underlying the Pleistocene alluvium at an unknown depth in the project area north of Tamalpais Drive, and exposed south of the road, is the Middle and Upper Jurassic (175,000,000 to 144,000,000 years B.P.) to the Lower Cretaceous (144,000,000 to 100,000,000 years B.P.) Franciscan Formation composed of volcanic and metavolcanic rocks, metamorphosed and unmetamorphosed sandstone, shale, conglomerate, chert, greenstone, and metagraywacke (Wagner and Bortugno 1999; Sloan 2006). Marine fossils, including *Icthysaurus*, *Belemnoidea*, *Buchia*, and *Inoceramus*, occur in the unmetamorphosed rocks of the Franciscan Complex (Berkeley Natural History Museum 2009). In the project area, the Franciscan Formation is predominantly comprised of a metamorphosed mélange, which is not fossiliferous (Sloan 2006). The Franciscan Complex is the basement rock of the region (Sloan 2006).

Recommendations

The project area is sensitive for both archaeological and architectural resources. The California Department of Transportation (Caltrans) will likely require preparation of the following cultural resources reports:

- Historic Property Survey Report (HPSR)
- Archaeological Survey Report (ASR)

- Historic Resource Evaluation Report (HRER)

Caltrans may require preparation of a Paleotological Identification Report, and additional studies depending on the results of the HPSR, ASR, and HRER.

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1941 *Mount Tamalpais, Calif.*, 15-minute topographic quadrangle. U.S. Geological Survey, Washington, D.C.

1995 *San Rafael, Calif.*, 7.5-minute topographic quadrangle. U.S. Geological Survey, Washington, D.C.

Wagner, D.L., E.J. Bortugno, and R.D. McJunkin
1990 *Geologic Map of the San Francisco-San Jose Quadrangle, California*, 1:250,000. Regional Geologic Map Series, San Francisco-San Jose-Map No. 5A. California Division of Mines and Geology, Sacramento.

2.2 Supplemental Cultural Resources Study

In August, 2009, LSA conducted a supplementary cultural resources study for Segments 1, 2, 3, and 10 of the 2009 *Draft Mill Valley to Corte Madera Bicycle and Pedestrian Corridor Study* to address additional areas that could potentially be affected by project improvements.

Records Search

On August 18, 2009, LSA conducted a records search (File #09-0208) of the additional Project Area and a 500-foot radius at the Northwest Information Center (NWIC) of the California Historical Resources Information System, Sonoma State University, Rohnert Park. The Project Areas were identified in the 2009 *Draft Mill Valley to Corte Madera Bicycle and Pedestrian Corridor Study*. The Project Areas consists of two additional sections of an existing bike path: the first is at the north end (Segment 10), and is the existing Sandra Marker Trail from Tamalpais Drive north and east to Wornum Way at Tamal Vista Avenue; and the second is at the south end and consists of Segments 1, 2, and 3) (Figure 1). Segment 1 extends from the northern end of Mill Valley-Sausalito Path to Vasco Court; Segment 2 extends from the bike path at Edna Maguire Elementary School along Lomita Road to Horse Hill bike path; and Segment 3 extends from the end of Lomita Drive parallel to Highway 101 to meadowswet Drive. The NWIC is the official state repository of cultural resource records and reports for Marin County. As part of the records search, the following federal and State of California inventories were reviewed:

- *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 30, 2009). The directory includes the listings of the National Register of Historic Places, National Historic Landmarks, the California Register of Historical Resources, California Historical Landmarks, and California Points of Historical Interest.

The records search did not identify any cultural resources within the additional Project Area. The record search identified two cultural resources within 500 feet of the Project Area.

Previously Recorded Archaeological Resource within 500 feet of the Project Area:

Segments 1, 2, and 3

- P-21-002633. Prehistoric midden deposit in the Alto Bowl/Horse Hill Open Space Preserve.

Previously Recorded Architectural Resource within 500 feet of the Project Area:

Segment 10

- P-21-002603. Historical Larkspur Redwood Presbyterian Church at 110 Magnolia Avenue.

Recommendations

The records search indicates no previously recorded cultural resources in the additional Project Area. The records search identified a prehistoric archaeological site within 500 feet of the Project Area at the south end (Segments 1, 2, and 3); and one historical architectural resource within 500 feet of the Project Area at the north end (Segment 10). Based on the results of the records search the Project Area is sensitive for archaeological resources and potentially sensitive for architectural resources. The California Department of Transportation (Caltrans) will likely require preparation of the following cultural resources reports:

- Historic Property Survey Report (HPSR)
- Archaeological Survey Report (ASR)

Based on the previous results of the 2009 Mill Valley to Corte Madera Multi-Use Pathway Project, Mill Valley, Marin County, California, Cultural Resources Summary, Caltrans may require preparation of a Historic Resources Evaluation Report. Caltrans may require preparation of additional studies depending on the results of the HPSR, ASR.

References Consulted

Alta/LandPeople

2009 *Draft – Mill Valley to Corte Madera Bicycle and Pedestrian Corridor Study*. Alta/LandPeople, Berkeley, California.

California Office of Historic Preservation

1976 *California Inventory of Historic Resources*. California Department of Parks and Recreation, Sacramento.

1988 *Five Views: An Ethnic Historic Sites Survey for California*. California Department of Parks and Recreation, Sacramento.

1992 *California Points of Historical Interest*. California Department of Parks and Recreation, Sacramento.

1996 *California Historical Landmarks*. California Department of Parks and Recreation, Sacramento.

2008 *Directory of Properties in the Historic Property Data File*, April 30, 2009. California Department of Parks and Recreation, Sacramento.

Evans, Sally

2007 Department of Parks and Recreation for 523 records for P-21-0002633. Archaeological Resource Service, Petaluma, California.

Supernowicz, Dana E.

2006 Department of Parks and Recreation form 523 records for P-21-0002603. Historic Resource Associates, El Dorado Hills, California.

U.S. Geological Survey

1995 *San Rafael, Calif.*, 7.5-minute topographic quadrangle. U.S. Geological Survey, Washington, D.C.

3.0 Preliminary Initial Study Checklists

LSA prepared an Initial Study (IS) for each of the three alternative routes using the most recent version of the Marin County environmental checklist. LSA used project details provided in the Draft Mill Valley to Corte Madera Bicycle and Pedestrian Corridor Study, prepared by Alta/LandPeople, to highlight the potential environmental issues that could result from implementation of the proposed project.

3.1 Route A – Horse Hill/Meadowsweet/Casa Buena

The following provides an overview of the results of the environmental analysis conducted for proposed Route A – the Horse Hill/Meadowsweet/Casa Buena Route. A brief discussion of the potential level of subsequent environmental analysis is also provided. A rough estimate of the probable costs to complete the environmental review process (i.e., studies, permitting, and environmental review) can be found at the end of this section.

Potentially Significant Environmental Impacts

LSA's preliminary environmental analysis identified the following potentially significant environmental concerns that will need to be addressed under both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA, for federal funding):

- **Geologic hazards**. The project site is located in the Bay Area and is therefore susceptible to seismically-induced hazards, such as ground shaking and ground failure. The potential for subsidence, expansive soils and liquefaction is not known at this time. A site-specific geotechnical study should be prepared to identify potential geotechnical constraints and to identify appropriate construction techniques.
- **Erosion.** Construction activities (i.e., grading, excavation) could result in increased erosion. Appropriate sediment and erosion control measures will need to be identified to mitigate this impact to a less than significant level.
- **Changes in Topography.** One alternative for Segment 3 of Route A involves rebuilding a portion of the Horse Hill Trail in a tunnel/trench to eliminate steep grades along this portion of the alignment. Construction of such a tunnel or trench could result in substantial changes to the existing topography as a result of tunnel/trench excavation. If this option is selected, this impact may be significant and unavoidable.
- **Construction Impacts.** Construction activities could result in temporary air and noise impacts to surrounding land uses. Implementation of standard mitigation measures (e.g., as required by the Bay Area Air Quality Management District, and the Marin County Noise Ordinance) would likely reduce these impacts to a less than significant level.
- **Special-Status Species Impacts.** Special status plant and animal species may occur in and adjacent to the project site and could be impacted by construction activities. Pre-construction surveys should be conducted to identify any special-status species in the vicinity of the project site and appropriate mitigation measures should be implemented to avoid impacts to these species.

- **Wetland Impacts.** A small drainage is located just west of Meadowsweet Drive. Any construction within or adjacent to jurisdictional waters of the U.S. or State would require regulatory permits and appropriate mitigation in consultation with regulatory agencies. A formal wetland delineation should be conducted to identify waters subject to the jurisdiction of the U.S. Army Corps of Engineers (Corps) and/or the Regional Water Quality Control Board (RWQCB).
- **Vegetation Removal.** Proposed corridor improvements would require the removal of redwood trees and other mature trees. Mitigation measures to compensate for the loss of native trees would be required.
- **Hazardous Materials.** Surface and near surface soil near Highway 101 could contain metals, petroleum hydrocarbons, and volatile organic compounds, such as aerially-deposited lead that could pose a hazard to worker safety during construction. Implementation of appropriate mitigation measures would likely reduce these impacts to a less than significant level.
- **Cultural Resources.** The project site is sensitive for cultural resources; therefore, construction activities could impact such resources. Additional study would be required to determine potential impacts to cultural resources and appropriate mitigation would be need to be identified, as necessary.

Additional Surveys, Studies, Permits Potentially Required

- Site-specific geotechnical study
- Special-status species surveys
- Natural Environment Study (*Caltrans*)
- Biological Assessment (*Caltrans, only required for projects potentially affecting federally-listed species*)
- Wetland delineation
- Clean Water Act (404) and/or Water Quality Certification (401) permits
- Phase I Environmental Site Assessment (*Caltrans*)
- Historic Property Survey Report/Archaeological Survey Report (*Caltrans*)
- Historical Resource Evaluation Report (*Caltrans*)

Subsequent CEQA and NEPA Review

Based on a preliminary environmental analysis, LSA believes a Mitigated Negative Declaration (MND) supported by an IS would be the appropriate level of environmental review for compliance under CEQA, assuming that the trench alternative is not pursued. LSA believes that Route A would qualify for a Categorical Exclusion for compliance with NEPA under Section 6004 of 23 CFR 771.

Opinion of Probable Environmental Review Costs

The following table provides an opinion of probable costs to complete the environmental review process. These costs are based on LSA's current understanding of the project and project area and provide a general approximation of the total cost to prepare subsequent technical studies, obtain permits, and prepare the appropriate environmental document for the proposed alignment. Because specific design details of the proposed corridor have not

been finalized, this opinion of probable costs represents what **may** be required. Some tasks may not be necessary if impacts to resources can be avoided through the final design process. Conversely, unanticipated tasks or studies may be identified during the planning process. Tasks listed below only address services that LSA could provide in-house, and thus provide a more informed cost opinion. These costs do not account for any hazardous waste, drainage, and/or geotechnical studies that may be required for the project. Construction-related costs and detailed mitigation costs are not included in the opinion of probable costs provided below.

Opinion of Probable Environmental Review Costs: Route A – Horse Hill/Casa Buena Route

Task	Cost Estimate
Natural Environment Study (including special-status species surveys)	$8,000 - $10,000
Wetland Delineation	$5,000 - $7,000
Biological Assessment (if needed)	$5,000 - $7,000
Regulatory Permits (if needed)	$4,000 - $8,000
Historic Property Survey Report/Archaeological Survey Report	$10,000 - $15,000
Historical Resource Evaluation Report (if needed)	$10,000 - $20,000
CEQA IS/MND	$14,000 - $20,000
Total Costs*	$56,000 - $87,000

* Cost range includes studies that may not be required.

3.2 Route B – Alto Tunnel

The following provides an overview of the results of the environmental analysis conducted for proposed Route B – the Alto Tunnel Route. A brief discussion of the potential level of subsequent environmental analysis is also provided. A rough estimate of the probable costs to complete the environmental review process (i.e., studies, permitting, and environmental review) can be found at the end of this section.

Potentially Significant Environmental Impacts

LSA's preliminary environmental analysis identified the following potentially significant environmental concerns that will need to be addressed under both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA, for federal funding):

- **Compatibility with Local Plans.** The project is included in the Marin Countywide Bicycle and Pedestrian Master Plan or other local planning documents. Furthermore, proposed improvements could result in environmental impacts that may conflict with environmental plans and policies adopted by the County or the adjacent communities of Mill Valley and Corte Madera. Further assessment of project compatibility with local plans and policies would likely be required.
- **Community Impacts.** Implementation of the project could result in a substantial increase in bicyclists and pedestrians using the proposed corridor. Increased use of the proposed corridor may alter the character of adjacent residential neighborhoods and downtown Corte Madera through which the corridor passes. This impact may be significant and unavoidable.
- **Geologic hazards.** The project site is susceptible to seismically-induced hazards, such as ground shaking and ground failure. In addition, tunnel rehabilitation could result in ground settlement, vibration, slope instability, and ground movement within and adjacent to the project site. Further geotechnical study will need to be prepared to ensure that adjacent residences are not at risk from activities associated with tunnel rehabilitation.
- **Erosion.** Construction activities (i.e., grading, excavation) could result in increased erosion. Appropriate sediment and erosion control measures will need to be identified to mitigate this impact to a less than significant level.
- **Drainage.** Both tunnel entrances contain standing water during wet conditions and the tunnel itself is expected to be wet due to surface runoff and/or groundwater. Drainage improvements have been included in the preliminary project design to capture, convey and treat runoff from the project. Additional study of the drainage area and the capacity of the drainage system may be required to ensure that proposed drainage improvements can adequately address project runoff and do not create substantial impacts to existing surface and ground waters. Additional mitigation measures may be required.
- **Flooding.** Drainage improvements have been designed to accommodate a 10-year storm event. Storm events in excess of the 10-year storm event could inundate the proposed corridor. Further study may need to be conducted to assess the potential for the proposed project to expose people or property to water related hazards. Mitigation measures may be required.
- **Water Quality.** Construction activities could impact the water quality of drainage systems adjacent to the project site. Implementation of BMPs during project construction would likely reduce potential water quality impacts to a less than significant level.

- **Construction Impacts.** Construction activities could result in temporary air and noise impacts to surrounding land uses. Implementation of standard mitigation measures (e.g., as required by the Bay Area Air Quality Management District, and the Marin County Noise Ordinance) would likely reduce these impacts to a less than significant level.
- **Traffic Impacts.** Increased use of the proposed corridor could impact traffic circulation at the East Blithedale/Lomita Avenue intersection and downtown Corte Madera. Further study may need to be conducted to assess the efficacy of proposed improvements at these locations on vehicular traffic. Additional mitigation measures may be required.
- **Safety and Security.** Use of the Alto Tunnel for bicyclists and pedestrians poses safety and security concerns related to the length of the tunnel, limited visibility and inaccessibility for emergency personnel. Improvements proposed as part of the project may mitigate these concerns to a less than significant level. However, additional mitigation measures may be required as the design of the corridor is finalized.
- **Special-Status Species Impacts.** Special status plant and animal species may occur in and adjacent to the project site and could be impacted by construction activities. Pre-construction surveys should be conducted to identify any special-status species in the vicinity of the project site and appropriate mitigation measures should be implemented to avoid impacts to these species.
- **Wetland Impacts.** Wetland areas occur at both tunnel entrances and would likely be impacted by construction of the project. Any construction within or adjacent to jurisdictional waters of the U.S. or State would require regulatory permits and appropriate mitigation in consultation with regulatory agencies. A formal wetland delineation should be conducted to identify waters subject to the jurisdiction of the U.S. Army Corps of Engineers (Corps), the Regional Water Quality Control Board (RWQCB), and/or the California Department of Fish and Game (CDFG).
- **Vegetation Removal.** Proposed corridor improvements would require the removal of trees and other native vegetation. Mitigation measures to compensate for the loss of native trees would be required.
- **Hazardous Materials.** Potentially contaminated materials may be removed from the tunnel during rehabilitation. These materials could pose a hazard to worker safety during construction. Implementation of appropriate mitigation measures would likely reduce these impacts to a less than significant level.
- **Public Services.** Increased use of the proposed corridor could result in the need for additional fire and police protection services to monitor activity and to respond to emergencies within the tunnel. Implementation of appropriate mitigation measures would likely reduce these impacts to a less than significant level.
- **Utilities.** Proposed improvements would require extension of utility service within the tunnel. If the project would result in significant interruptions of service or require new capacity, this impact could be considered significant and mitigation measures would be required.
- **Solid Waste.** Rehabilitation of the Alto Tunnel could create significant amounts of solid waste for disposal. If local landfills have insufficient capacity to accommodate the solid waste generated by the proposed project, this impact would be considered potentially significant and mitigation measures would be required.
- **Cultural Resources.** The project site is sensitive for cultural resources; therefore, construction activities could impact such resources. Additional study would be required to determine potential impacts to cultural resources and appropriate mitigation would be need to be identified, as necessary.

- **Aesthetics/Visual Resources.** Construction of proposed improvements would require extensive grading and vegetation removal that could alter the existing visual character of the project site. The design and placement of improvements should be developed to minimize visual impacts. Implementation of mitigation measures, such as native landscaping and rockwork in disturbed areas, may be required to reduce these impacts to a less than significant level.

Additional Surveys, Studies, Permits Potentially Required

- Site-specific geotechnical study
- Special-status species surveys
- Natural Environment Study (*Caltrans*)
- Biological Assessment (*Caltrans, only required for projects potentially affecting federally-listed species*)
- Wetland delineation
- Clean Water Act (404), Water Quality Certification (401), and/or Streambed Alteration Agreement permits
- Phase I Environmental Site Assessment (*Caltrans*)
- Historic Property Survey Report/Archaeological Survey Report (*Caltrans*)
- Historical Resource Evaluation Report (Caltrans)
- Extended Phase I Evaluation (*Caltrans, triggered only for projects that may affect subsurface cultural resources*)

Subsequent CEQA and NEPA Review

Based on a preliminary environmental analysis, LSA believes an Environmental Impact Report (EIR) would be the appropriate level of environmental review for compliance under CEQA. Although most of the environmental impacts could be mitigated to a less than significant level with implementation of proposed improvements and/or appropriate mitigation measures, the nature of the identified impacts and the level of public controversy surrounding this alternative may warrant the preparation of an EIR. It is possible, though unlikely, that the project could be addressed by a Categorical Exclusion under Section 6004 of 23 CFR 771 to satisfy the requirements of NEPA. In the event that a Categorical Exclusion is not the appropriate level of environmental review under NEPA, then an Environmental Assessment (EA) supported by a Finding of No Significant Impact (FONSI) would be prepared.

Opinion of Probable Environmental Review Costs

The following table provides an opinion of probable costs to complete the environmental review process. These costs are based on LSA's current understanding of the project and project area and provide a general approximation of the total cost to prepare subsequent technical studies, obtain permits, and prepare the appropriate environmental document for

the proposed alignment. Because specific design details of the proposed corridor have not been finalized, this opinion of probable costs represents what **may** be required. Some tasks may not be necessary if impacts to resources can be avoided through the final design process. Conversely, unanticipated tasks or studies may be identified during the planning process. Tasks listed below only address services that LSA could provide in-house, and thus provide a more informed cost opinion. These costs do not account for any hazardous waste, drainage, and/or geotechnical studies that may be required for the project. Construction-related costs and detailed mitigation costs are not included in the opinion of probable costs provided below.

Opinion of Probable Environmental Review Costs: Route B – Alto Tunnel Route

Task	Cost Estimate
Natural Environment Study (including special-status species surveys)	$12,000 - $16,000
Wetland Delineation	$8,000 - $12,000
Biological Assessment (if needed)	$8,000 - $12,000
Regulatory Permits (if needed)	$10,000 - $20,000
Historic Property Survey Report/Archaeological Survey Report	$12,000 - $15,000
Historical Resource Evaluation Report (if needed)	$15,000 - $20,000
Extended Phase I Study (if needed)	$25,000 - $50,000
EIR or EIR/EA/FONSI	$75,000 - $125,000
Total Costs*	$165,000 - $270,000

* Cost range includes studies that may not be required.

3.3 Route C – The Camino Alto/Corte Madera Avenue

The following provides an overview of the results of the environmental analysis conducted for proposed Route C – the Camino Alto/Corte Madera Avenue Route. A brief discussion of the potential level of subsequent environmental analysis is also provided. A rough estimate of the probable costs to complete the environmental review process (i.e., studies, permitting, and environmental review) can be found at the end of this section.

Potentially Significant Environmental Impacts

Our preliminary environmental analysis identified the following potentially significant environmental concerns that will need to be addressed under both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA, for federal funding):

- **Geologic hazards**. The project site is located in the Bay Area and is therefore susceptible to seismically-induced hazards, such as ground shaking and ground failure. The potential for subsidence, expansive soils and liquefaction is not known at this time. A site-specific geotechnical study should be prepared to identify potential geotechnical constraints and to identify appropriate construction techniques.
- **Erosion.** Construction activities (i.e., grading, excavation) could result in increased erosion. Appropriate sediment and erosion control measures will need to be identified to mitigate this impact to a less than significant level.
- **Drainage.** Drainage improvements (i.e., culvert extension) would be required to accommodate the proposed project. Additional study of the drainage area, capacity, and condition of existing culverts should be conducted to ensure proposed improvements are sufficient to accommodate project drainage. If not, mitigation may be required. In addition, construction activities could impact the water quality of drainage adjacent to the project site. Implementation of BMPs during project construction would likely reduce potential water quality impacts to a less than significant level.
- **Construction Impacts.** Construction activities could result in temporary air and noise impacts to surrounding land uses. Implementation of standard mitigation measures (e.g., as required by the Bay Area Air Quality Management District, and the Marin County Noise Ordinance) would likely reduce these impacts to a less than significant level.
- **Special-Status Species Impacts.** Special status plant and animal species may occur in and adjacent to the project site and could be impacted by construction activities. Pre-construction surveys should be conducted to identify any special-status species in the vicinity of the project site and appropriate mitigation measures should be implemented to avoid impacts to these species.
- **Wetland Impacts.** Approximately eight drainages flow from the hillsides west of Camino Alto/Corte Madera Avenue and enter culverts that extend beneath the existing roadway. Any construction within or adjacent to jurisdictional waters of the U.S. or State would require regulatory permits and appropriate mitigation in consultation with regulatory agencies. A formal wetland delineation should be conducted to identify waters subject to the jurisdiction of the U.S. Army Corps of Engineers (Corps) and/or the Regional Water Quality Control Board (RWQCB).

- **Vegetation Removal.** Proposed corridor improvements would require the removal of several redwood trees and other native vegetation. Mitigation measures to compensate for the loss of native trees would be required.
- **Hazardous Materials.** Construction activities could result in the temporary release of hazardous substances, such as fuel and oil, into existing drainages. Implementation of BMPs during project construction would likely reduce these impacts to a less than significant level.
- **Cultural Resources.** The project site is sensitive for cultural resources; therefore, construction activities could impact such resources. Additional study would be required to determine potential impacts to cultural resources and appropriate mitigation would be need to be identified, as necessary.
- **Aesthetics/Visual Resources.** Construction of proposed improvements would require extensive grading, vegetation removal, and installation of retaining walls along portions of the alignment that could alter the existing visual character of the project area. The design and placement of improvements should be developed to minimize visual impacts. Implementation of mitigation measures, such as native landscaping and rockwork in disturbed areas, may be required to reduce these impacts to a less than significant level.

Additional Surveys, Studies, Permits Potentially Required

- Site-specific geotechnical study
- Special-status species surveys
- Natural Environment Study (*Caltrans*)
- Biological Assessment (*Caltrans, only required for projects potentially affecting federally-listed species*)
- Wetland delineation Clean Water Act (404) and/or Water Quality Certification (401) permits
- Historic Property Survey Report/Archaeological Survey Report (*Caltrans*)
- Historical Resource Evaluation Report (*Caltrans*)
- Extended Phase I Evaluation (*Caltrans, triggered only for projects that may affect subsurface cultural resources*).

Subsequent CEQA and NEPA Review

Based on a preliminary environmental analysis, LSA believes a Mitigated Negative Declaration (MND) supported by an IS would be the appropriate level of environmental review for compliance under CEQA. Route C would likely qualify for a Categorical Exclusion for compliance with NEPA under Section 6004 of 23 CFR 771.

Opinion of Probable Environmental Review Costs

The following table provides an opinion of probable costs to complete the environmental review process. These costs are based on LSA's current understanding of the project and project area and provide a general approximation of the total cost to prepare subsequent technical studies, obtain permits, and prepare the appropriate environmental document for the proposed alignment. Because specific design details of the proposed corridor have not been finalized, this opinion of probable costs represents what **may** be required. Some tasks

may not be necessary if impacts to resources can be avoided through the final design process. Conversely, unanticipated tasks or studies may be identified during the planning process. Tasks listed below only address services that LSA could provide in-house, and thus provide a more informed cost opinion. These costs do not account for any drainage and/or geotechnical studies that may be required for the project. Construction-related costs and detailed mitigation costs are not included in the opinion of probable costs provided below.

Opinion of Probable Environmental Review Costs: Route C – Camino Alto/Corte Madera Avenue Route

Task	Cost Estimate
Natural Environment Study (including special-status species surveys)	$10,000 - $16,000
Wetland Delineation	$6,000 - $8,000
Biological Assessment (if needed)	$6,000 - $10,000
Regulatory Permits (if needed)	$6,000 - $10,000
Historic Property Survey Report/Archaeological Survey Report	$12,000 - $15,000
Historical Resource Evaluation Report (if needed)	$15,000 - $20,000
Extended Phase I Study (if needed)	$25,000 - $50,000
CEQA IS/MND	$16,000 - $22,000
Total Cost*	$96,000 - $151,000

* Cost range includes studies that may not be required.