

05 **APPENDIX A:
DESIGN
ELEMENTS**



Trails will be designed with an appreciation for what makes the region and each trail segment distinctive historically, ecologically, and experientially.

INTRODUCTION

FORTAG showcases some of the world's most uniquely beautiful landscapes. Its trails are the means by which intimate experiences in this wondrous environment are made possible.

The overall concept approach will be:

- To engage in human-scale design to create intuitive, and comfortable experiences.
- To extend the reach of well-loved and notable native, endemic plant communities across the trail.
- To create both a consistent regional trail brand as well as a trail language for unique segments.
- To embrace the many aesthetic features of the area, and extend them through the materials.

DESIGN OBJECTIVES

Goal 1: Provide year round safe active transportation and recreation opportunities for hikers, bicyclists, equestrians, skiers, and other non-motorized uses.

Goal 2: Promote user awareness, appreciation, and protection of natural, scenic, cultural, and historic resources and promote community involvement in their protection and care.

Goal 3: Incorporate trail designs that mimic the natural, historic, and cultural environment along the trail.

Goal 4: Provide a safe and continuous travel experience that incorporates safe and easy access from local communities and connections to nearby major recreation areas on adjacent public land.

Goal 6: Promote healthy lifestyles through exercise, interpretation and education, and trail stewardship activities.

Goal 7: Stimulate local active transportation and recreation that can boost economic opportunities linked to the uniqueness of the area — its environment, culture, heritage, people, and history.



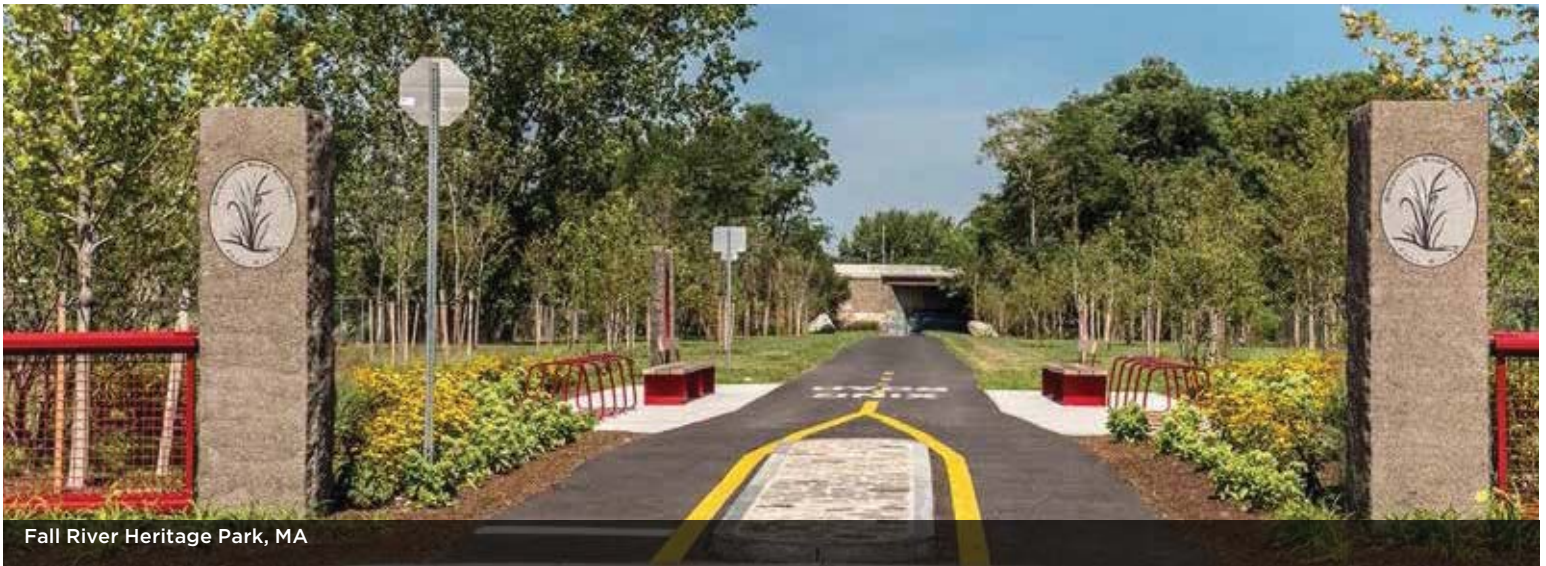
Milton Street Park, CA

PHOTO: MOUNTAINS RECREATION AND CONSERVATION AUTHORITY

PLACEMAKING

Placemaking features like architectural gateways and custom paved surfaces help to welcome trail users and create a visual identity for the trail system. These features are important as they can serve as signature elements for the FORTAG trail network. Trail amenities will primarily serve to provide areas where visitors can enjoy views without trampling areas off-trail, and help draw attention to the trail from adjacent streets and trails.

Visual interest is enhanced through native plantings, newly created interpretive elements, seating, art, wayfinding, and shade structures.



Fall River Heritage Park, MA

PHOTO:FRIENDS OF THE QUEQUECHAN RAIL TRAIL

Gateways

Gateways are significant entryways that reflect local culture and emphasize the connection to other neighboring trail systems. Gateways provide access from existing public roads or easements and typically include the following features: automobile parking,

bicycle parking, picnic tables, drinking fountains, trash receptacles, dog waste stations, bicycle repair stations, and trail wayfinding and informational signage.



Craven Street Trailhead, Asheville, North Carolina

PHOTO:MEG REILLEY PHOTOGRAPHY, WWW.MEGREILLEY.COM

Trailheads

Trailheads provide essential access to the trail system and can include similar amenities to gateways.

Trailhead should be context sensitive, responding to adjacent land uses and environmental context. Scale varies based on site availability.



Many Parks Curve Outlook, Larimer County, CO

PHOTO: [HTTPS://INSPIREDIMPERFECTION.COM/ADVENTURES/MANY-PARKS-CURVE-OVERLOOK/](https://inspiredimperfection.com/adventures/many-parks-curve-overlook/)

Observation Points

Areas designated for scenic overlooks, which may include a trail, small interpretive display, and a bench or small seating area. These areas allow users to take in views and rest without disturbing surrounding habitat.



Big Horn Trail, Las Vegas, NV

PHOTO: JIM BOONE. [HTTPS://WWW.BIRDANDHIKE.COM/HIKE/DNWR/CC_BIGHORN/_CC_BIGHORN.HTM](https://www.birdandhike.com/hike/dnwr/cc_bighorn/_cc_bighorn.htm)



Trapezio by Urbidermis

PHOTO: DAVID LEVIN



Quequechan River Rail Trail - Fall River, MA

PHOTO: GREGG SHUPE, [HTTPS://WWW.SHUPESTUDIOS.COM/](https://www.shupestudios.com/)

Trailside Rest Stop

A designated seating area which may include benches or a limited number of picnic tables, and trash receptacles.



PLANTING

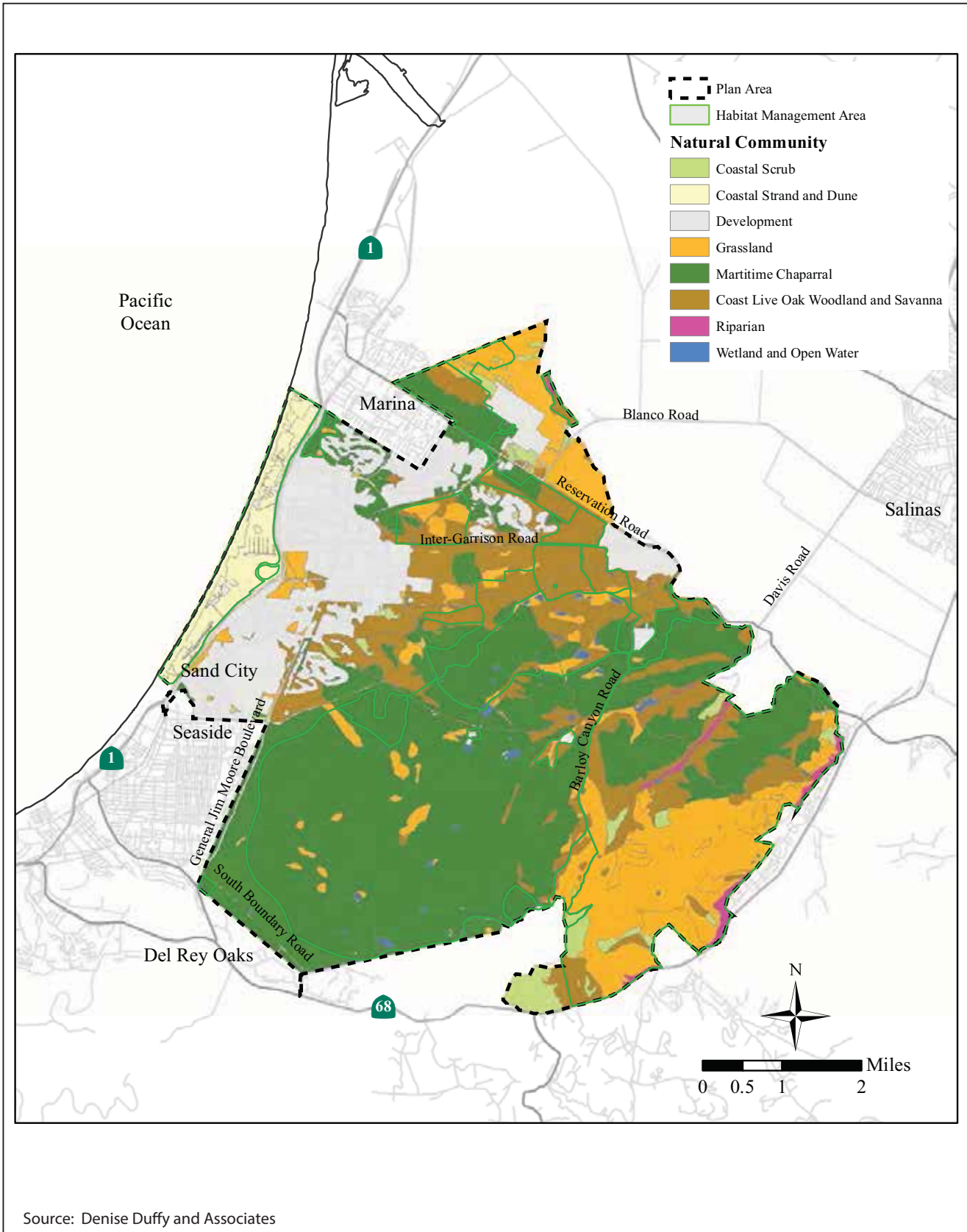
The FORTAG project area has a dynamic history of development and habitation, transitioning through periods of heavy use and relative abandonment. The barracks style buildings that surround the CSUMB campus are uninhabited and nature has begun reclaiming the space.

FORTAG, being predominantly inland from the immediate coastal zone, provides exposure to plant communities typically not associated with the popular idea of the Monterey area. Instead of being defined by the Monterey Cypress, FORTAG showcases oak woodlands and maritime chaparral.

While nearer the coast, Monterey Pine forest and Monterey Cypress forest plant communities are present, a mix of northern coastal scrub, maritime chaparral, and coast live oak woodland are visible through the inland portions of the trail.

These native plant communities have thrived since the closure of Fort Ord, and FORTAG provides an opportunity to help preserve these communities as development continues throughout the former base.

The plant species shown on the following pages are organized by the dominant plant communities that make up the project area. They are all native plants and many are available from nurseries in the region specializing in California Native species. In areas along the trail to receive landscape planting, care must take place in determining what plant community is represented at that location, and the appropriate plants chosen from a plant palette reflecting that particular community. Figure 2-2 from the Fort Ord Multi-Species Habitat Conservation Plan to the right shows the rough distribution of the various plant communities present at Fort Ord.



Graphics ... 06533.07 HCP 4/18/2017/TG

Source: Denise Duffy and Associates



Figure 2-2
Natural Communities in the Plan Area

Coast Live Oak Woodland

Coast Live Oak Woodland is characterized by an open to nearly closed-canopy community with a sparsely scattered shrub or grass understory. The dominant tree species is *Quercus agrifolia* however there may be small pockets of *Pinus radiata* and *Pinus muricata* within the fog bank influenced portion of the Oak Woodlands. Oak Woodland habitats are important to a variety of plant and animal species, including HCP species. They provide nesting sites, cover, forage, and habitat connectivity. Some oak woodland plants are commercially grown in regional nurseries specializing in California native plants, and are useful and recommended for trailside planting installations. They can help define trail edges, provide shade, or used to enhance important nodes or connections. Care should be taken when planting pine species to ensure that nursery grown stock does not out compete existing wild stock.



PHOTO: [HTTPS://CALSCAPE.ORG/QUERCUS-AGRIFOLIA-\(COAST-LIVE-OAK\)?SRCHCR=SC5F1FC1E92C18B](https://calscape.org/quercus-agrifolia-(coast-live-oak)?srchcr=sc5f1fc1e92c18b)

QUERCUS AGRIFOLIA

Coast Live Oak
25'-80' tall and 15'-35' wide
Nursery availability - Yes



PHOTO: [HTTPS://SELECTTREE.CALPOLY.EDU/TREE-DETAIL/PINUS-MURICATA](https://selecttree.calpoly.edu/tree-detail/pinus-muricata)

PINUS MURICATA

Bishop Pine
50'-70' tall and 20'-40' wide
Nursery availability - Sparse



PHOTO: [HTTPS://SEQUOIATREES.COM/PRODUCTS/MONTEREY-PINE-SMALL-TREE-SEEDLING](https://sequoiatrees.com/products/monterey-pine-small-tree-seedling)

PINUS RADIATA

Monterey Pine
50'-100' tall and 25'-35' wide
Nursery availability - Yes



PHOTO: [HTTPS://CALSCAPE.ORG/ARTEMISIA-CALIFORNICA-\(CALIFORNIA-SAGEBRUSH\)?SRCHCR=SC5F74E9B1D9893](https://calscape.org/artemisia-californica-(california-sagebrush)?srchcr=sc5f74e9b1d9893)

ARTEMISIA CALIFORNICA

California Sagebrush
1'-8' tall and 4' wide
Native

HCP species associated with Oak Woodland and Oak Savannah at Fort Ord primarily occur in natural clearings and include Sand Gilia, Seaside Bird's Beak, and Monterey Spineflower.



PHOTO: [HTTPS://CALSCAPE.ORG/BACCHARIS-PILULARIS-\(COYOTE-BUSH\)?SRCHCR=SC5F74EA03B3A8B](https://calscape.org/baccharis-pilularis-(coyote-bush)?srchcr=SC5F74EA03B3A8B)

BACCHARIS PILULARIS

Coyote Bush
2'-10' tall and 12' wide
Nursery availability - Yes



PHOTO: [HTTPS://WWW.LASPILITAS.COM/NATURE-OF-CALIFORNIA/PLANTS/612--SALVIA-MELLIFERA](https://www.laspilitas.com/nature-of-california/plants/612--salvia-mellifera)

SALVIA MELLIFERA

Black Sage
3'-6' tall and 10' wide
Nursery availability - Yes



PHOTO: DEAN WM. TAYLOR [HTTPS://CALSCAPE.ORG/GILIA-TENUIFLORA-SSP.-ARENARIA-\(MONTEREY-GILIA\)?SRCHCR=SC5F74EB92129A4](https://calscape.org/gilia-tenuiflora-ssp.-arenaria-(monterey-gilia)?srchcr=SC5F74EB92129A4)

GILIA TENUIFLORA SSP. ARENARIA

Monterey Sand Gilia
.5' tall and .5' wide
Nursery availability - No



PHOTO: JOHN DOYEN [HTTPS://CALSCAPE.ORG/PHOTOS/66649?SRCHCR=SC5F74EB2ACADE1](https://calscape.org/photos/66649?srchcr=SC5F74EB2ACADE1)

CHORIZANTHE PUNGENS VAR. PUNGENS

Monterey Spineflower
.5' tall and .5' wide
Nursery availability - No



PHOTO: [HTTP://WWW.ELKHORN-SLOUGHCTP.ORG/FACTSHEET/FACTSHEET.PHP?SPECIES_ID=42](http://www.elkhornsloughctp.org/factsheet/factsheet.php?species_id=42)

CORDYLANTHUS RIGIDUS SSP. LITTORALIS

Seaside Bird's Beak
.5' tall and .5' wide
Nursery availability - No

Maritime Chaparral

Maritime chaparral is the most dominant plant community within Ford Ord. It is represented by a variety of hard-leaved, evergreen shrubs occurring in moderate to high-density, and is generally limited to the summer fog zone. It supports a variety of bird and small mammal species along with HCP plant species.

Some Maritime chaparral plants are commercially grown in regional nurseries specializing in California native plants, and are useful and recommended for trailside planting installations. They can be used to help define trail edges, stabilize slopes, or as ornamental planting in focus areas along the trail.



PHOTO: [HTTPS://CALSCAPE.ORG/PHOTOS/70?SRCHCR=SC5F74ED63E45B3](https://calscape.org/photos/70?srchcr=sc5f74ed63e45b3)

ADENOSTOMA FASCICULATUM

Chamise

3'-12' tall and 1'-8' wide

Nursery availability - Yes



PHOTO: AARON E. SIMS [HTTPS://CALSCAPE.ORG/PHOTOS/70?SRCHCR=SC5F74ED63E45B3](https://calscape.org/photos/70?srchcr=sc5f74ed63e45b3)

ARCTOSTAPHYLOS TOMENTOSA

Woollyleaf Manzanita

3'-10' tall and 10' wide

Nursery availability - Sparse



PHOTO: [HTTPS://CALSCAPE.ORG/ARCTOSTAPHYLOS-PAJAROENSIS-\(PAJARO-MANZANITA\)?SRCHCR=SC5F74EDF8B2BF0](https://calscape.org/arctostaphylos-pajaroensis-(pajaro-manzanita)?srchcr=sc5f74edf8b2bf0)

ARCTOSTAPHYLOS PAJAROENSIS

Pajaro Manzanita

3.5'-15' tall and 10' wide

Nursery availability - Yes



PHOTO: [HTTPS://CALSCAPE.ORG/ARCTOSTAPHYLOS-PAJAROENSIS-\(PAJARO-MANZANITA\)?SRCHCR=SC5F74EDF8B2BF0](https://calscape.org/arctostaphylos-pajaroensis-(pajaro-manzanita)?srchcr=sc5f74edf8b2bf0)

CEANOTHUS THYRSIFLORUS

Creeping Blueblossom

2'-3' tall and 15' wide

Nursery availability - Yes



PHOTO:SUSAN MCDUGALL [HTTPS://WWW.CALFLORA.ORG/CGI-BIN/SPECIES_QUERY.CGI?WHERE-TAXON=Ceanothus+rigidus](https://www.calflora.org/cgi-bin/species_query.cgi?where-taxon=Ceanothus+rigidus)

CEANOTHUS RIGIDUS

Monterey Ceanothus
1'-8' tall and 4' wide
Nursery availability - As cultivars



PHOTO:HTTPS://CALSCAPE.ORG/HETEROMELES-ARBUTIFOLIA-(TOYON)?SRCHCR=SC5F74EB6E22C

HETEROMELES ARBUTIFOLIA

Toyon
6'-30' tall and 10'-15' wide
Nursery Availability - Yes

HCP species associated with Maritime Chaparral include Seaside Bird's Beak, Sand Gilia, Monterey Spineflower, and Yodon's piperia.



PHOTO:DEAN WM. TAYLOR [HTTPS://CALSCAPE.ORG/GILIA-TENUIFLORA-SSP-ARENARIA-\(MONTEREY-GILIA\)?SRCHCR=SC5F74EB92129A4](https://calscape.org/gilia-tenuiflora-ssp-arenaria-(monterey-gilia)?srchcr=sc5f74eb92129a4)

GILIA TENUIFLORA SSP. ARENARIA

Monterey Sand Gilia
.5' tall and .5' wide
Nursery availability - No



PHOTO:JOHN DOYEN [HTTPS://CALSCAPE.ORG/PHOTOS/66649?SRCHCR=SC5F74EB2ACADE1](https://calscape.org/photos/66649?srchcr=sc5f74eb2acade1)

CHORIZANTHE PUNGENS VAR. PUNGENS

Monterey Spineflower
.5' tall and .5' wide
Nursery availability - No



PHOTO:HTTP://WWW.ELKHORNSLOUGHCTP.ORG/FACTSHEET/FACTSHEET.PHP?SPECIES_ID=42

CORDYLANTHUS RIGIDUS SSP. LITTORALIS

Seaside Bird's Beak
.5' tall and .5' wide
Nursery availability - No



PHOTO:HTTPS://CALPHOTOS.BERKELEY.EDU/CGI/IMG_QUERY?ENLARGE=0000+0000+0905+0016

PIPERIA YADONII

Yadon's Rein-orchid
.5' tall and .5' wide
Nursery availability - No

Coastal Scrub

The Coastal scrub plant community is integrated with grassland, maritime chaparral, oak woodland, and dune scrub within Fort Ord. It is characterized by sparse to dense occurrences of primarily soft-leaved, low-stature shrubs such as coyote brush, California sagebrush, and black sage. It is considered an important plant community because it provides a protective habitat for HCP plant species, forage for wildlife, and helps stabilize sandy soils and steep slopes. Some of the plants associated with the Coastal Scrub community have nursery availability and can be used in trailside landscape planting.



PHOTO: [HTTPS://CALSCAPE.ORG/ARCTOSTAPHYLOS-PUMILA-\(DUNE-MANZANITA\)?SRCHCR=SC5F74EF8FE916C](https://cal-scape.org/arctostaphylos-pumila-(dune-manzanita)?srchcr=sc5f74ef8fe916c)

ARCTOSTAPHYLOS PUMILA

Dune Manzanita
1.'-5' tall and 5' wide
Nursery availability - Sparse



PHOTO: [HTTPS://CALSCAPE.ORG/BACCHARIS-PILULARIS-\(COYOTE-BUSH\)?SRCHCR=SC5F74EA03B3A8B](https://cal-scape.org/baccharis-pilularis-(coyote-bush)?srchcr=sc5f74ea03b3a8b)

BACCHARIS PILULARIS

Coyote Bush
2'-10' tall and 12' wide
Nursery availability - Yes



PHOTO: [HTTPS://CALSCAPE.ORG/ARTEMISIA-CALIFORNICA-\(CALIFORNIA-SAGEBRUSH\)?SRCHCR=SC5F74E9BID9893](https://cal-scape.org/artemisia-californica-(california-sagebrush)?srchcr=sc5f74e9bid9893)

ARTEMISIA CALIFORNICA

California Sagebrush
1'-8' tall and 4' wide
Nursery availability - Yes



PHOTO: STEVE MATSON [HTTPS://CALSCAPE.ORG/PHOTOS/1517?SRCHCR=SC5F74EFD56FA58](https://cal-scape.org/photos/1517?srchcr=sc5f74efd56fa58)

ERIOGONUM LATIFOLIUM

Coast Buckwheat
1'-2' tall and 3' wide
Nursery availability - Yes



PHOTO: [HTTPS://WWW.LASPILITAS.COM/NATURE-OF-CALIFORNIA/PLANTS/291--ERIOGONUM-PARVIFOLIUM](https://www.laspilitas.com/nature-of-california/plants/291--erogonum-parvifolium)

ERIOGONUM PARVIFOLIUM

Seacliff Buckwheat
1'-3' tall and 2'-3' wide
Nursery availability - Yes



PHOTO: [HTTPS://WWW.LASPILITAS.COM/NATURE-OF-CALIFORNIA/PLANTS/612--SALVIA-MELLIFERA](https://www.laspilitas.com/nature-of-california/plants/612--salvia-mellifera)

SALVIA MELLIFERA

Black Sage
3'-6' tall and 10' wide
Nursery availability - Yes

HCP species associated with Coastal Scrub include Seaside Bird's Beak, Sand Gilia, Monterey Spineflower, and Yodon's piperia.



PHOTO: DEAN WM. TAYLOR [HTTPS://CALSCAPE.ORG/GILIA-TENUIFLORA-SSP-ARENARIA-\(MONTEREY-GILIA\)?SRCHCR=SC5F74EB92129A4](https://calscape.org/gilia-tenuiflora-ssp-arenaria-(monterey-gilia)?srchcr=SC5F74EB92129A4)

GILIA TENUIFLORA SSP. ARENARIA

Monterey Sand Gilia
.5' tall and .5' wide
Nursery availability - No



PHOTO: JOHN DOYEN [HTTPS://CALSCAPE.ORG/PHOTOS/66649?SRCHCR=SC5F74EB2ACADE1](https://calscape.org/photos/66649?srchcr=SC5F74EB2ACADE1)

CHORIZANTHE PUNGENS VAR. PUNGENS

Monterey Spineflower
.5' tall and .5' wide
Nursery availability - No



PHOTO: [HTTP://WWW.ELKHORN-SLOUGHCTP.ORG/FACTSHEET/FACTSHEET.PHP?SPECIES_ID=42](http://www.elkhornsloughctp.org/factsheet/factsheet.php?species_id=42)

CORDYLANTHUS RIGIDUS SSP. LITTORALIS

Seaside Bird's Beak
.5' tall and .5' wide
Nursery availability - No



PHOTO: [HTTPS://CALPHOTOS.BERKELEY.EDU/CGI/IMG_QUERY?ENLARGE=0000+0000+0905+0016](https://calphotos.berkeley.edu/cgi/img_query?enlarge=0000+0000+0905+0016)

PIPERIA YADONII

Yadon's Rein-orchid
.5' tall and .5' wide
Nursery availability - No

Grassland

Much of the grassland present at Fort Ord consists of non-native annual grasses. Some native perennial bunch grass stands exist, however, primarily inland and scattered as small meadows amongst coast live oak woodland and maritime chaparral. Grasslands are important nesting and forage habitat for many animal species, and also protect the soil against erosion. Some native, perennial grasses are available in nurseries and are mixed with trailside landscape plantings to provide texture, increase habitat value, and stabilize the soil.



PHOTO: STEVE MATSON [HTTPS://CALSCAPE.ORG/DANTHONIA-CALIFORNICA-\(CALIFORNIA-OATGRASS\)?SRCHCR=SC5F74F0A67697F](https://calscape.org/danthonia-californica-(california-oatgrass)?srchcr=sc5f74f0a67697f)

DANTHONIA CALIFORNICA

California Oat Grass
2'-3' tall and 1'-2' wide
Nursery availability - Sparse



PHOTO: NEAL KRAMER [HTTPS://CALSCAPE.ORG/LUPINUS-NANUS-\(SKY-LUPINE\)?SRCHCR=SC5F74F26474C39](https://calscape.org/lupinus-nanus-(sky-lupine)?srchcr=sc5f74f26474c39)

LUPINUS NANUS

Sky Lupine
2'-3' tall and 1'-2' wide
Nursery availability - Sparse



PHOTO: JEAN PAWEK [HTTPS://CALSCAPE.ORG/ELYMUS-GLAUCUS-\(BLUE-WILDRYE\)?SRCHCR=SC5F74F0D737FD9](https://calscape.org/elymus-glaucus-(blue-wildrye)?srchcr=sc5f74f0d737fd9)

ELYMUS GLAUCUS

Blue Wild Rye
1'-5' tall and 1'-2' wide
Nursery availability - Yes



PHOTO: JEAN PAWEK [HTTPS://CALSCAPE.ORG/STIPA-PULCHRA-\(PURPLE-NEEDLEGRASS\)?SRCHCR=SC5F74F236DFCFF](https://calscape.org/stipa-pulchra-(purple-needlegrass)?srchcr=sc5f74f236dfcff)

STIPA PULCHRA

Blue Wild Rye
1'-5' tall and 1'-2' wide
Nursery availability - Yes

HCP supported to a limited extent in grasslands include Seaside Bird's Beak, Sand Gilia, Monterey Spineflower, and Yodon's piperia.



PHOTO: [HTTPS://WWW.SMGROWERS.COM/PRODUCTS/PLANTS/PLANTDISPLAY.ASP?PLANT_ID=1505](https://www.smgrowers.com/products/plants/plantdisplay.asp?plant_id=1505)

SISYRINCHIUM BELLUM

Blue Eyed Grass

1' tall and 1'-2' wide

Nursery availability - Yes



PHOTO: DEAN WM. TAYLOR [HTTPS://CALSCAPE.ORG/GILIA-TENUIFLORA-SSP-ARENARIA-\(MONTEREY-GILIA\)?SRCHCR=SC5F74EB92129A4](https://calscape.org/gilia-tenuiflora-ssp-arenaria-(monterey-gilia)?srchcr=SC5F74EB92129A4)

GILIA TENUIFLORA SSP. ARENARIA

Monterey Sand Gilia

.5' tall and .5' wide

Nursery availability - No



PHOTO: JOHN DOYEN [HTTPS://CALSCAPE.ORG/PHOTOS/66649?SRCHCR=SC5F74EB2ACADE1](https://calscape.org/photos/66649?srchcr=SC5F74EB2ACADE1)

CHORIZANTHE PUNGENS VAR. PUNGENS

Monterey Spineflower

.5' tall and .5' wide

Nursery availability - No



PHOTO: [HTTP://WWW.ELKHORN-SLOUGHCTP.ORG/FACTSHEET/FACTSHEET.PHP?SPECIES_ID=42](http://www.elkhornsloughctp.org/factsheet/factsheet.php?species_id=42)

CORDYLANTHUS RIGIDUS SSP. LITTORALIS

Seaside Bird's Beak

.5' tall and .5' wide

Nursery availability - No



PHOTO: [HTTPS://CALPHOTOS.BERKELEY.EDU/CGI/IMG_QUERY?ENLARGE=0000+0000+0905+0016](https://calphotos.berkeley.edu/cgi/img_query?enlarge=0000+0000+0905+0016)

PIPERIA YADONII

Yadon's Rein-orchid

.5' tall and .5' wide

Nursery availability - No

Coastal Strand and Dune

Comprised of a dynamic plant community adapted to a moving sand substrate and changing dune and beach configurations. Much of the coastal area supports a stabilized dune community dominated by non-native ice plant. In areas with healthy coastal strand and dune communities, native perennial herbs, shrubs, and subshrubs are supported including wild buckwheats, lupines, and deerweed. Nursery available coastal stand and dune plants can be used in trailsides landscape planting in the coastal zone to provide enhance habitat and help stabilize sandy soils.



PHOTO:JOHN DOYEN [HTTPS://CALSCAPE.ORG/ABRONIA-LATIFOLIA-\(SAND-VERBENA\)?SRCHCR=SC5F74F3DE75B16](https://CALSCAPE.ORG/ABRONIA-LATIFOLIA-(SAND-VERBENA)?SRCHCR=SC5F74F3DE75B16)

ABRONIA LATIFOLIA

Sand Verbena
2'-3' tall and 1'-2' wide
Nursery availability - No



PHOTO:JOHN DOYEN [HTTPS://CALSCAPE.ORG/ACMISPON-GLABER-\(DEER-WEED\)?SRCHCR=SC5F74F4084C4E2](https://CALSCAPE.ORG/ACMISPON-GLABER-(DEER-WEED)?SRCHCR=SC5F74F4084C4E2)

ACMISPON GLABER

Common Deerweed
1'-3' tall and 3' wide
Nursery availability - Sparse



PHOTO:NPS EMPLOYEE [HTTPS://CALSCAPE.ORG/CAMISSONIOPSIS-CHEIRANTHIFOLIA-SSP-CHEIRANTHIFOLIA-\(BEACH-EVENING-PRIMROSE\)?SRCHCR=SC5F74F4575D31C](https://CALSCAPE.ORG/CAMISSONIOPSIS-CHEIRANTHIFOLIA-SSP-CHEIRANTHIFOLIA-(BEACH-EVENING-PRIMROSE)?SRCHCR=SC5F74F4575D31C)

CAMISSONIA CHEIRANTHIFOLIA

SSP. CHEIRANTHIFOLIA

Beach Evening Primrose
.5' tall and .5'-3' wide
Nursery availability - Sparse



PHOTO:STEVE MATSON [HTTPS://CALSCAPE.ORG/PHOTOS/1517?SRCHCR=SC5F74EFD56FA58](https://CALSCAPE.ORG/PHOTOS/1517?SRCHCR=SC5F74EFD56FA58)

ERIOGONUM LATIFOLIUM

Coast Buckwheat
1'-2' tall and 3' wide
Nursery availability - Yes



PHOTO: [HTTPS://WWW.LASPILITAS.COM/NATURE-OF-CALIFORNIA/PLANTS/291--ERIOGONUM-PARVIFOLIUM](https://www.laspilitas.com/nature-of-california/plants/291--erogonum-parvifolium)

ERIOGONUM PARVIFOLIUM

Seacliff Buckwheat
 1'-3' tall and 2'-3' wide
 Nursery availability - Yes



PHOTO: [HTTPS://WWW.SMGROWERS.COM/PRODUCTS/PLANTS/PLANTDISPLAY.ASP?PLANT_ID=3963](https://www.smgrowers.com/products/plants/plantdisplay.asp?plant_id=3963)

LUPINUS ALBIFRONS

Bush Lupine
 1' tall and 1'-2' wide
 Nursery availability - Yes

HCP supported by coastal strand and dune include Sand Gilia and Monterey Spineflower.



PHOTO: DEAN WM. TAYLOR [HTTPS://CALSCAPE.ORG/GILIA-TENUIFLORA-SSP.-ARENARIA-\(MONTEREY-GILIA\)?SRCHCR=SC5F74EB92129A4](https://calscape.org/gilia-tenuiflora-ssp.-arenaria-(monterey-gilia)?srchcr=sc5f74eb92129a4)

GILIA TENUIFLORA SSP. ARENARIA

Monterey Sand Gilia
 .5' tall and .5' wide
 Nursery availability - No



PHOTO: JOHN DOYEN [HTTPS://CALSCAPE.ORG/PHOTOS/66649?SRCHCR=SC5F74EB2ACADE1](https://calscape.org/photos/66649?srchcr=sc5f74eb2acade1)

CHORIZANTHE PUNGENS VAR. PUNGENS

Monterey Spineflower
 .5' tall and .5' wide
 Nursery availability - No



Lewis MacAdams Riverfront Park, Los Angeles, CA

PHOTO:LYDIA KENSELAAR

SITE FURNISHINGS

Furniture will be used in the project to strengthen design concepts through materiality, form, and intention. Furnishings will appear at trailheads, viewpoints, and rest areas.

These physical elements will create places of respite along the extensive trail network, and are opportunities to define the design language of FORTAG, and create spaces that encourage repeated use of the trail.



Info-Point, Bolzano, Italy

PHOTO:NOA WWW.DESIGNBOOM.COM/ARCHITECTURE/NOA-SWINGING-FRAMES-INSTALLATION-ITALY-06-04-2016/



Armitage Education Center Pavilion, Lawrence, KS

PHOTO:KANSAS BIOLOGICAL SURVEY



Asbury Woods Nature Center, Erie, PA

PHOTO:ASBURY WOODS NATURE CENTER FACEBOOK PAGE



Sensory Pavilion, KS

PHOTO:DIRT WORK STUDIO WWW.DIRTWORKSSTUDIO.KU.EDU/#SENSORY-PAVILION/99



Student Project

PHOTO:HTTPS://WWW.SOHU.COM/A/315552036_200550

Structures

Shade structures, seat walls, and other physical enhancements can have design qualities that reinforce the design theme. All structures built within the FORTAG will utilize a consistent architectural style and use materials that blend with the landscape character to minimize visual impacts.



Wilson Underline, Chicago, IL

PHOTO:WILSON UNDERLINE [HTTPS://WILSONUNDERLINE.COM/VERSION/](https://wilsonunderline.com/version/)



Pico Pebble Seat by Barrell Sculpture

PHOTO:[HTTPS://WWW.EXTERNALWORKSINDEX.CO.UK/ENTRY/140908/BARRELL-SCULPTURE/PICO-PEBBLE-SEAT/#](https://www.externalworksindex.co.uk/entry/140908/barrell-sculpture/pico-pebble-seat/#)



Milton Street Park

PHOTO:SWA [HTTPS://SWABALSLEY.COM/PROJECTS/MILTON-STREET-PARK-2/](https://swabalsley.com/projects/milton-street-park-2/)



Los Angeles State Historic Park, Los Angeles, CA

PHOTO:SEAN CARTER



Bucharest, Romania

PHOTO:[HTTPS://WWW.MMCITE.COM/US/NEWS/BUCHAREST-COMES-TO-LIFE-THANKS-TO-MMCITE](https://www.mmcite.com/us/news/bucharest-comes-to-life-thanks-to-mmcite)



Vistula Boulevard, Warsaw, Poland

PHOTO:RS ARCHITEKTURA KRAJOBRAZU
[HTTP://LANDEZINE.COM/INDEX.PHP/2018/02/VISTULA-BOULEVARDS-BY-RS-ARCHITEKTURA-KRAJOBRAZU/](http://landezine.com/index.php/2018/02/vistula-boulevards-by-rs-architektura-krajobrazu/)

Seating

Seating contributes to the user experience by inviting users to rest, congregate, or contemplate. Seating opportunities along the trail provide a short relief and also promote added enjoyment of the scenic environment. Seating areas are designed to create identity along the trail.



Strasse des Friedens, 2017, Eschdorf, Luxembourg

PHOTO: [HTTPS://WWW.JHEMP-BASTIN.COM/COPIE-DE-TREES-RECONSTRUCTED-1](https://www.jhemp-bastin.com/coapie-de-trees-reconstructed-1)



High Trestle Trail, Woodward, Iowa

PHOTO: JAKE BOYD



Centennial Center Park, Centennial, CO

PHOTO: DCLA [HTTPS://WWW.DCLA.NET/HOME-SLIDESHOW](https://www.dcla.net/home-slideshow)

Public Art

Art installations can encourage play, function as interpretive aids, or serve as a trail's primary attraction. Innovative trail design includes developing site plans with art features as well as more common amenities such as seating and signage.



Simple Park Benches and Tables

PHOTO: JAAK NILSON, [HTTPS://FINEARTAMERICA.COM/FEATURED/SIMPLE-PARK-BENCHES-AND-TABLES-JAAK-NILSON.HTML](https://fineartamerica.com/featured/simple-park-benches-and-tables-jaak-nilson.html)



PHOTO: [HTTPS://WWW.ARTFORMURBAN.CO.UK/BULL-PICNIC-TABLE.HTML](https://www.artformurban.co.uk/bull-picnic-table.html)

Picnic Tables

Picnic tables should have a sturdy construction and placed either individually or clustered in groups. Picnic tables provide places for trail users to congregate for meals, relax, or have informal events.



PHOTO: REGINA ARNOLD
[HTTPS://FINEARTAMERICA.COM/FEATURED/BICYCLE-RACK-REGINA-ARNOLD.HTML](https://fineartamerica.com/featured/bicycle-rack-regina-arnold.html)



Bicycle Parking

Bicycle racks provide opportunities for trail users to use the trail as transportation, where users can engage in other activities without the worry of losing their bicycles. Racks will be placed at all trailhead areas, and throughout CSUMB.



PHOTO: [HTTPS://WWW.ARTFORMURBAN.CO.UK/CORTE-LITTER-BIN.HTML](https://www.artformurban.co.uk/corte-litter-bin.html)

Trash Receptacles

Trash receptacles are installed at trail entry points and as-needed for user convenience. While requiring dedicated maintenance, they will help prevent the spread of refuse throughout the trail corridor and onto surrounding areas. The appearance should match other trail amenities.



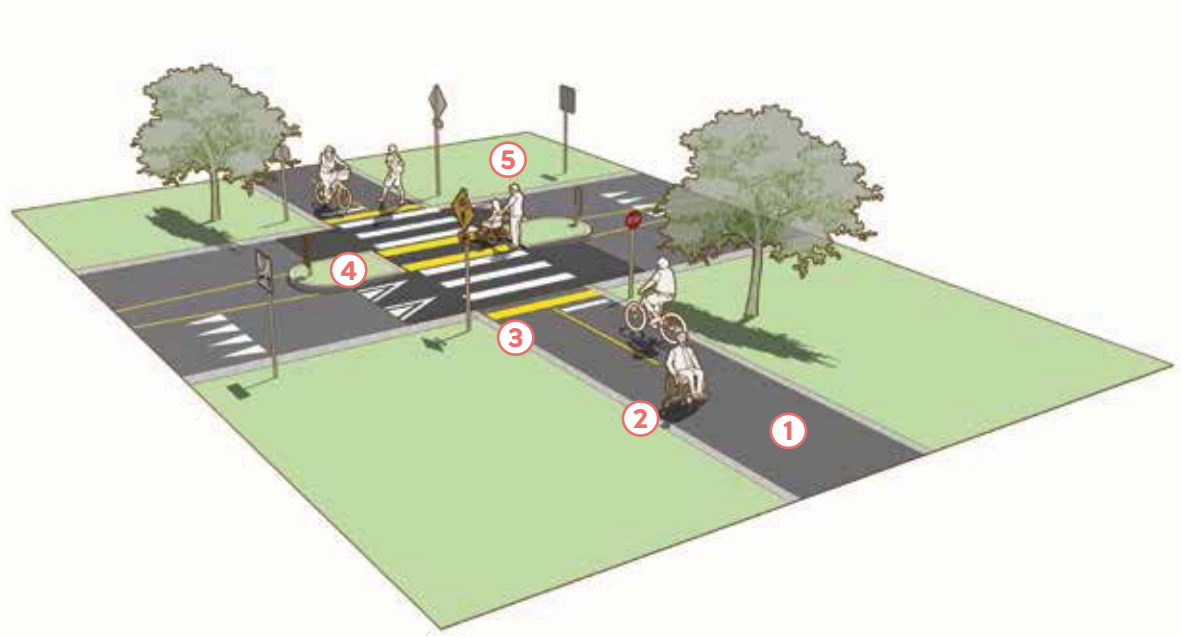
PHOTO: [HTTP://WWW.BELSON.COM/HAWS-BARRIER-FREE-POWDER-COATED-HI-LO-WITH-PET-BOWL-PEDESTAL-DRINKING-FOUNTAIN](http://www.belson.com/haws-barrier-free-powder-coated-hi-lo-with-pet-bowl-pedestal-drinking-fountain)



PHOTO: [HTTPS://WWW.ARTFORMURBAN.CO.UK/FUENTE-FOUNTAIN.HTML](https://www.artformurban.co.uk/fuente-fountain.html)

Water Fountains

Drinking fountains are spaced at regular intervals that correspond with key gateways and landmarks. Locating fountains with multiple heights will help accommodate a range of user ages and physical abilities, as well as pets.



SOURCE: ALTA PLANNING + DESIGN
STAR GUIDE

STREET INTERSECTIONS AND CROSSINGS

Well-designed crossings are essential for trail safety, convenience, and support continuous travel experiences. Developing and selecting the proper treatments for each unique location is important whether it requires a grade-separated crossing, traffic calming, or an actuated signal.

The proposed FORTAG alignment will cross public roadways in several locations. Most of these crossings will be at-grade, requiring improvements and modifications such as: roadway and lane modifications; construction of medians, curb extensions, warning devices, and traffic control devices; and changes to signing and striping to enhance bike and pedestrian crossing safety.

FORTAG will also include several undercrossings, pedestrian/bicycle bridges, and roundabouts.

DESIGN FEATURES

- ① **Shared Use Path.** The single path combines bicyclists and pedestrians in both directions.
- ② **Network Connection Opportunities.** When constructed outside of a roadway corridor, a shared use path offers a low-stress experience away from motor vehicles.
- ③ **Roadway Crossings.** Where paths intersect roads, enhancements should improve conditions for path users.
- ④ **Intersection Crossings.** Enhancements such as median crossing islands or raised crossings can increase comfort and safety for path users.
- ⑤ **Route Markings.** Markings identify proper positioning within the roadway and alert all users to bicyclist presence.



Long Beach, CA

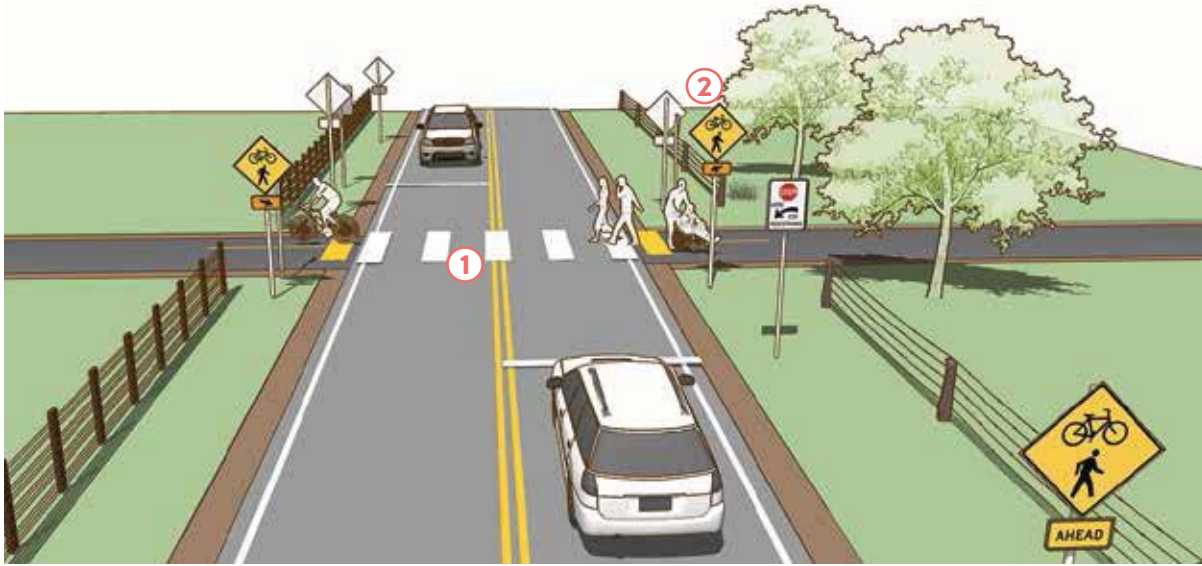
PHOTO: [HTTP://WWW.LONGBEACH.GOV/GOACTIVE/LB/MOBILITY-TOOLKIT/BICYCLE-TREATMENTS/BICYCLE-BOULEVARDS/](http://WWW.LONGBEACH.GOV/GOACTIVE/LB/MOBILITY-TOOLKIT/BICYCLE-TREATMENTS/BICYCLE-BOULEVARDS/)

Roundabouts

Mini roundabouts and neighborhood traffic circles are a popular design solution for intersections because they lower speeds at minor intersection crossings and are an ideal treatment for continuous flow of traffic. They may be installed using simple markings or raised islands, but are best applied in conjunction with plantings that beautify the street and the surrounding neighborhood. Careful attention should be paid to the available lane width and turning radius used with traffic circles.

At a roundabout, drivers yield to cars circling the center island and exit at their desired street. Cyclists similarly follow the curve to their destination.

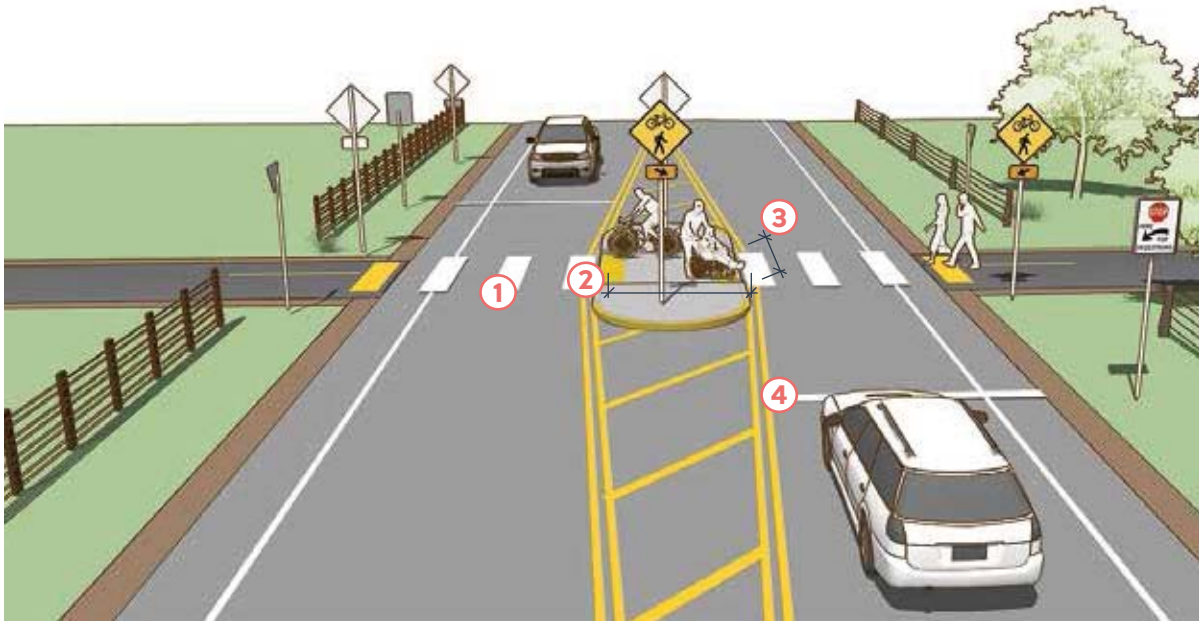




Mid-Block Trail Crossing

DESIGN FEATURES

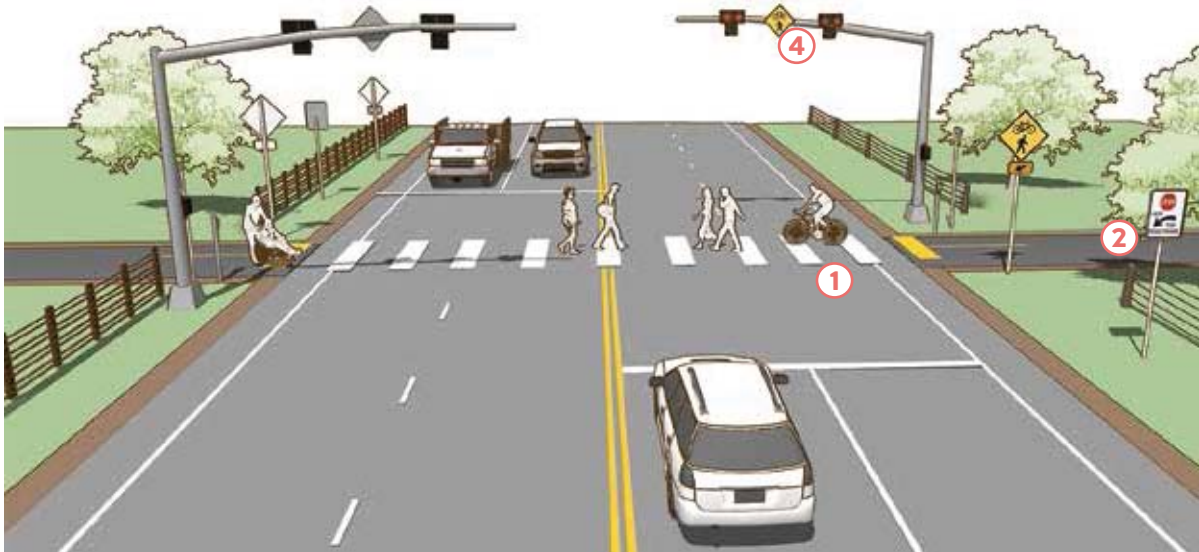
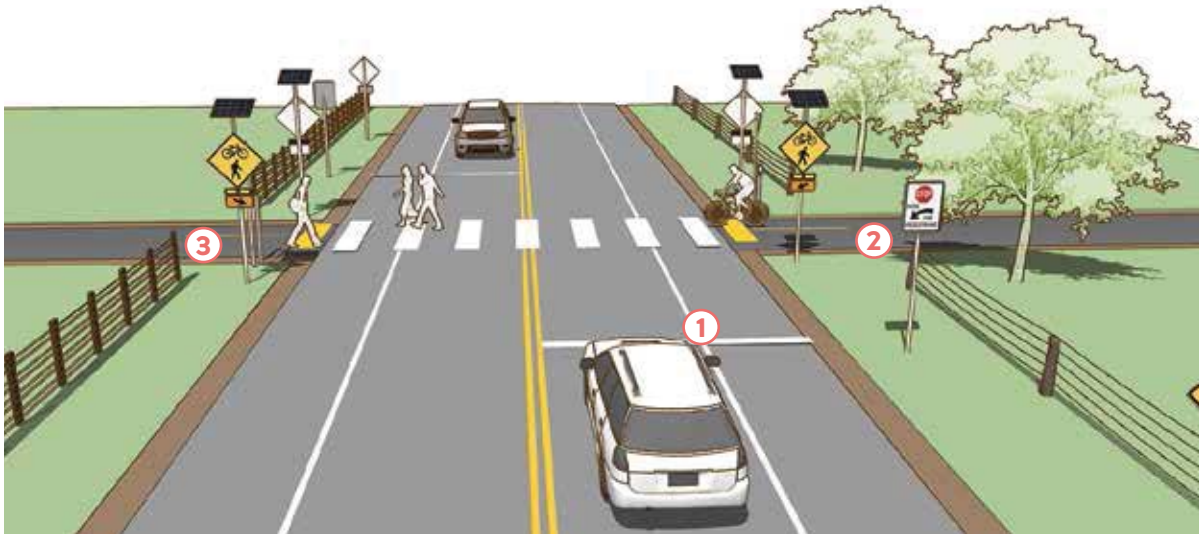
- 1 Crosswalk.** Appropriate high visibility crosswalk markings should be installed.
- 2 Warning Signs.** A Bicycle/Pedestrian warning sign (W11-15) with Downward Arrow plaque (W16-7P) at the crossing, on both sides. Signs are used to warn users of the crossing location.



Mid-Block Trail Crossing with Refuge Island

DESIGN FEATURES

- ① **Crosswalk.** Median islands should be paired with a Marked Crosswalk and Advanced Yield Line crossing treatment package.
- ② **Refuge Area.** The bicycle waiting area should be at least 8 ft deep to allow for a variety of bicycle types.
- ③ **Safety Island.** A median safety island should allow path users to cross one lane of traffic at a time. It should be the same width as the crosswalk.
- ④ **Horizontal Deflection.** To promote yielding to bicyclists the median safety island should be designed to require horizontal deflection of the motor vehicle travel lanes.



Flashing Beacons and Hybrid Beacons

DESIGN FEATURES

- ① **Crosswalk.** A marked Crosswalk and Advance Stop Bar crossing treatment package should be paired with the full traffic signal.
- ② **Stop Sign.** A stop line and STOP HERE ON RED sign should be used.
- ③ **Rectangular Rapid Flash Beacons (RRFB).** Where yield compliance is low, rectangular rapid flash beacons can be used to draw attention to crossing path users and signal their intent to cross.
- ④ **Pedestrian Hybrid Beacon (PHB).** On multi-lane streets with high volumes and few gaps for crossing, a pedestrian hybrid beacon may be used to increase yielding rates.



Boardwalk Botanic Ridge, Cranbourne, Australia

PHOTO: [HTTPS://WWW.GRDESIGNANDCONSTRUCT.COM.AU/GALLERY/PORTFOLIO/BOARDWALK-BOTANIC-RIDGE/](https://www.grdesignandconstruct.com.au/gallery/portfolio/boardwalk-botanic-ridge/)

Boardwalks

Boardwalks are typically required when crossing sensitive areas such as wetlands, sand dunes, or poorly drained areas. They can also be used to provide trail access in areas where grading may harm established vegetation or create trail surfaces that wildlife will not cross. Boardwalks should be considered in relation to environmental impacts. They can be constructed of concrete, wooden planks or recycled material planks that form the top layer of the boardwalk.



Tahoe East Shore Trail, Lake Tahoe

PHOTO: JASON BEAN/RGJ WWW.RGJ.COM/PICTURE-GALLERY/NEWS/2019/11/14/PHOTOS-RECENT-WORK-RGJ-PHOTOGRAPHER-JASON-BEAN/4192444002/

New Smyrna Beach, FL

PHOTO: [HTTPS://WWW.NEWSDAYTONABEACH.COM/STORIES/SMYRNA-DUNES-BOARDWALK-PROJECT-CONTINUES-DESPITE-BEING-STALLED-BY-IRMA.3128](https://www.newsdaytonabeach.com/stories/smyrna-dunes-boardwalk-project-continues-despite-being-stalled-by-irma.3128)



PHOTO SIMULATION:ALTA PLANNING + DESIGN



PHOTO SIMULATION:ALTA PLANNING + DESIGN

Bridges

Bicycle/pedestrian bridges provide trail continuity and access to areas separated by barriers such as deep canyons, waterways, or major transportation corridors. Bridges offer an opportunity to create a focal point that enhances the trail experience and

supports community identity. When creating high-quality and comfortable facilities for people walking and cycling it is important to note that the type and size of bridges can vary depending on the trail type and specific site requirements.



Gwynns Falls Trails, Lochearn, MD

PHOTO:GWYNNS FALLS TRAILS
[HTTP://WWW.GWYNNSFALLSTRAIL.ORG/TRAIL_INFORMATION.CFM](http://www.gwynnsfallstrail.org/trail_information.cfm)



Merritt Parkway, CT

PHOTO:BRIAN A. POUNDS / HEARST CONNECTICUT MEDIA
[HTTPS://WWW.CTPOST.COM/LOCAL/ARTICLE/BIKE-TRAIN-STRETCHES-FROM-BRIDGEPORT-TO-NEWTOWN-13056868.PHP](https://www.ctpost.com/local/article/bike-train-stretches-from-bridgeport-to-newtown-13056868.php)



McCaslin Boulevard Underpass - City of Louisville, CO

PHOTO:LORIS. [HTTP://LORISANDASSOCIATES.COM/SERVICES/PED-BRIDGES/MCCASLIN-BOULEVARD-UNDERPASS-CITY-OF-LOUISVILLE-CO](http://lorisandassociates.com/services/ped-bridges/mccaslin-boulevard-underpass-city-of-louisville-co)



PHOTO SIMULATION:ALTA PLANNING + DESIGN

Undercrossing

An alternative to bridges, where topography or roadway design permits, undercrossings should be constructed within the most direct path of travel, providing trail continuity beneath roadways and other locations where trails meet or cross significant public infrastructure or grade changes.

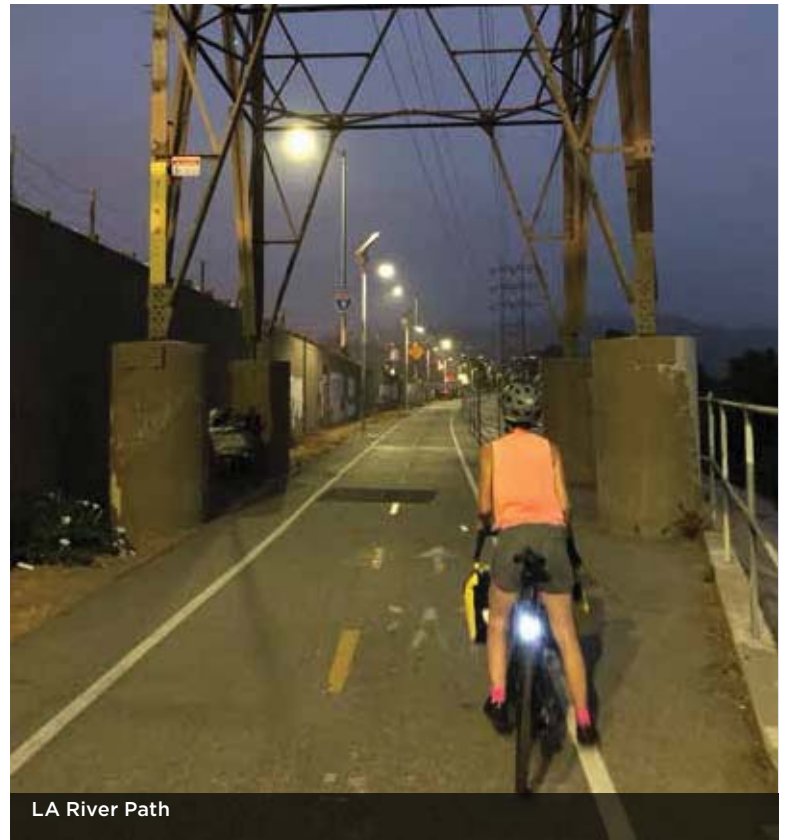
LIGHTING

Lighting for built trails are analyzed per segment context with full consideration for safety needs, wildlife habitat, trail function, cost benefit, and maintenance commitments. In general, lighting is not used for trails in remote areas, trails with low use, or where there is little to no development. However, trails that function as transportation corridors must balance these considerations with commuter comfort and safety. Lighting improves the visibility of roadways at crossings and trails. Lighting may also be necessary for day-time use in trail tunnels and underpasses.

Trail lighting that is properly designed can improve visibility and natural surveillance, increase trail access and use, provide a sense of safety and security, and extend operating hours during shorter days. In addition, properly lit trails reduce bicycle and pedestrian collisions during night time hours.

Guidelines for Lighting on Trails

- Lighting should be at pedestrian scale. Placement, spacing, and other finish specifications depend on the fixture and optics.
- Good lighting improves natural surveillance and visibility.
- Lighting should minimize energy usage, operating costs, light trespass, light pollution and glare.
- Place lighting at decision points and areas of interest, such as street crossings, intersections with other trails, trail spurs, and near commercial and mixed-use developments.
- Illuminate only the intended targeted areas and use cut-off fixtures that aim lights down instead of above or behind the fixture, which causes light pollution.
- Consider Crime Prevention Through Environmental Design (CPTED) principles whenever lighting is introduced, such as color rendering, areas of concealment, and abstracted illumination.
- Use energy efficient lamps that comply with environmental guidelines, and that provide adequate color rendering.
- Consider timers, sensors, and remote-control technology which can enhance the sense of security and conserve energy.
- Lighting should avoid trees and be placed outside of the canopy edge.
- Solar powered lighting is available where utility connection is not feasible or when alternative energy sources are desired. Daylight hours should be analyzed per season prior to specifying solar lighting.
- Avoid light fixtures at eye level that could cause glare and impair visibility.



LA River Path

PHOTO:LYDIA KENSELAAR

Lighting Fixture Types

BOLLARD LIGHTS

Bollard lights are low level lights that provide illumination or wayfinding at trail entrances or intersections where pavement surface or accent lighting is desired. Bollard lights are not considered to be security and safety features as they do not provide good color rendering nor do they illuminate near eye levels. However, when used in combination with pole lighting, they can be effective in the lighting network.



Location/Project Not Specified by Firm

PHOTO:HERMAMM DESIGN GROUP [HTTP://HERMANNDESIGNGROUP.COM/PORTFOLIO/PARK-DESIGN/](http://HERMANNDESIGNGROUP.COM/PORTFOLIO/PARK-DESIGN/)



LA River Path

PHOTO:LYDIA KENSELAAR



PHOTO:[HTTP://WWW.OTIMSAN.COM/TAG/AYAKLI-YONLENDIRME](http://WWW.OTIMSAN.COM/TAG/AYAKLI-YONLENDIRME)

POLE LIGHTS

Pole lights are commonly used along trails, streetscapes, and parks. Pole lights provide a uniform light that increases visibility for trail users. Pole lights come in a wide variety of styles and finishes, and can be solar powered or wired. Many pole lights have cut-off features that can eliminate light pollution above and behind the bulbs and reduce glare for trail users. This feature is a significant benefit for lighting in residential areas where there are concerns about light pollution for neighboring homes.

INTEGRATED LIGHTING

Lighting can be integrated into furnishings, art, architectural and wayfinding elements, planting beds, handrails, and other trail features.

Solar Lighting Fixtures

BENEFITS OF SOLAR LIGHTING

Many cities and organizations are choosing solar power to light their outdoor public spaces because of the many advantages it offers over traditional wired lighting. Solar lighting companies have also adopted Light Emitting Diode (LED) bulb technology, which requires little to no maintenance over their life cycle. The benefits of solar lighting include:

- **No Electrical Grid Connection Cost**
Solar fixtures are ideal for projects that are expensive to build a connection to the electrical grid. These costs can vary depending on distance or other local engineering challenges.
- **Avoid Trenching Costs**
Trenching and installing electrical connections for a pathway can quickly become expensive. Solar lighting avoids the need to trench for wires.
- **Reduce Site Disruption and Restoration**
With trenching for wires also comes the disruption of the site, closing of the trail during construction and the cost of site restoration afterwards. Solar products only require the footing for the poles to be installed, greatly reducing the overall disruption and restoration of surface grade.
- **Faster Installation**
With less work required for site preparation and with self-contained fixtures, installation time of most solar fixtures is reduced.
- **No Power Outages**
Solar fixtures are designed with the capacity to stay on regardless of variations in weather or power outages.
- **Sustainable Light**
Solar lights generate all of the power they need, eliminating the need for power from the grid. Solar light fixtures prevent greenhouse gas emissions.

- **Remove Risk of Theft and Corrosion**

Electrical wires can be vulnerable to theft and corrosion, especially in more acidic soil conditions. Solar lights eliminate the risk and have features to make them vandal resistant. Many solar fixtures have been designed to match the aesthetic of wired lights but with the advantages of solar power.

CONSTRAINTS OF SOLAR LIGHTING

- **Upfront Investment**
The upfront investment for solar LED lighting is higher than for conventional wired lighting. However, long term servicing and maintenance is very low. A financial analysis is recommended to determine the cost benefit of using solar lighting for FORTAG. Also, it is very important when working with the solar lighting manufacturer to understand what parts of the fixture and product are guaranteed as well as life cycle and durability.
- **Solar Battery Lifespan**
Solar lights include batteries that need periodic replacement.
- **Indirect or Variable Sunlight Conditions**
Solar lighting fixtures typically require 2–5 hours of direct sunlight per day. However, some lighting companies have developed controllers that adapt to surroundings and save power. Additionally, companies are developing software for remote management to help optimize the lighting system or predict lower energy periods.
- **Limited Aesthetic**
Most solar lighting fixtures serve a very practical purpose. The primary design program is to house or host the photovoltaic panel and prevent theft and vandalism. As a result, their finishes can be limited and tend toward the more modern simple aesthetic. Selection is improving as the industry expands.



Noordboulevard, Den Haag, Netherlands

PHOTO: PITCH POWER, [HTTPS://PITCH-POWER.NL/FOTO-VIDEO/](https://pitch-power.nl/foto-video/)

Conventional Lighting Fixtures

BENEFITS OF CONVENTIONAL LIGHTING

- **Market Availability/Competitiveness**
Conventional electrical lighting is typically more affordable than solar lighting due to the basic technology of the fixtures, wide availability and competitive pricing across North America.
- **Wider Range of Fixture Styles and Finishes**
The current market for electrical lighting styles spans a wide range from traditional to modern. The color, finish, and form of both pole and bollard lights have many options which can be matched to current lighting in and around FORTAG.
- **Flexibility in Color Temperature**
Color temperature of lighting refers to the light appearance of a light bulb and is measured in degrees Kelvin. Electrical lighting offers more flexibility with color temperature.

CONSTRAINTS OF CONVENTIONAL LIGHTING

- **Trenching Requirement**
Electrical wiring for lighting requires trenching by machine, which is disruptive to the site and existing improvements. Trails may need to be closed during the installation of electrical wiring to accommodate the equipment and laborers.
- **Availability of Power Source**
Conventional electrical lighting requires connection to the electrical grid, and available sources for the connections can be limited or require additional trenching outside the trail corridor. Specific power connections were not assessed during the physical assessment and should be completed by an electrical engineer if a wired lighting system is selected.
- **Operating Cost**
Conventional fixtures require a steady supply of electricity.