



BOTHIN MARSH OPEN SPACE PRESERVE

EVOLVING SHORELINES

BCDC Design Review Board Exhibits

March 9, 2026

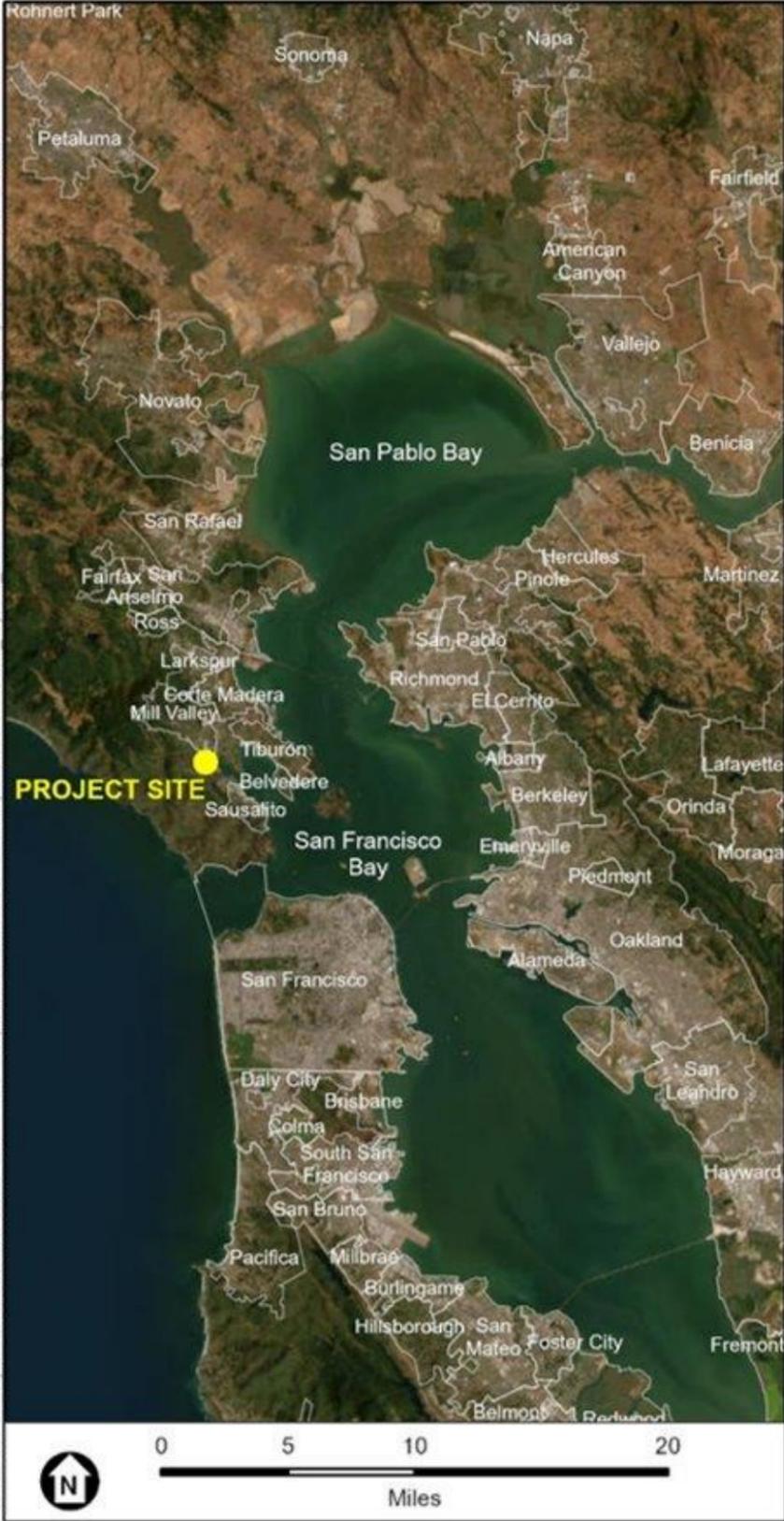
PROJECT OVERVIEW



PROJECT TIMELINE

- 2016: Planning for Climate Change at Bothin Marsh identified as a joint priority for the One Tam collaborative
- 2018: Community Engagement initiated
- 2019: Evolving Shorelines, the shared vision for Bothin Marsh published
- 2020: Initial Planning Memo published
- 2021: Evolving Shorelines Planning and Adaptation Concepts published
- 2023: Feasibility Studies and Preliminary Design completed
- 2025: 30% Design Completed
- 2026: Initiating CEQA and 65% Design

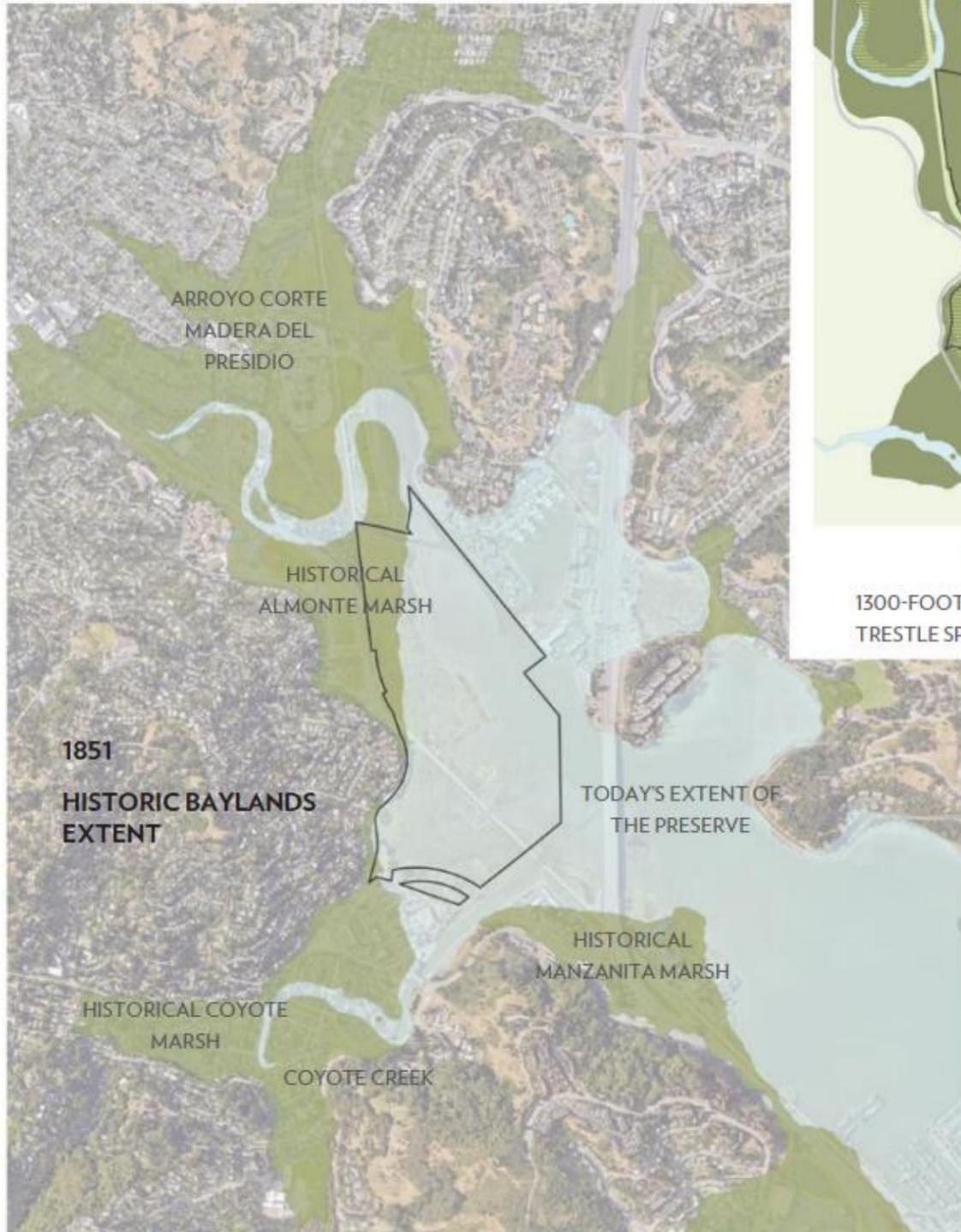
PROJECT LOCATION



SITE HISTORY



SITE HISTORY



1924

1300-FOOT-LONG RAILROAD TRESTLE SPANS OPEN WATER



1946

RAILROAD BERM BUILT, EXTENSIVE FILL, SHORT BRIDGE OVER COYOTE CREEK



1968

COYOTE CREEK CHANNELIZED, NEW BRIDGE OVER THE CHANNEL, OLD BRIDGE REMOVED AND TIDAL INFLUENCE BLOCKED IN SOUTH BOTHIN



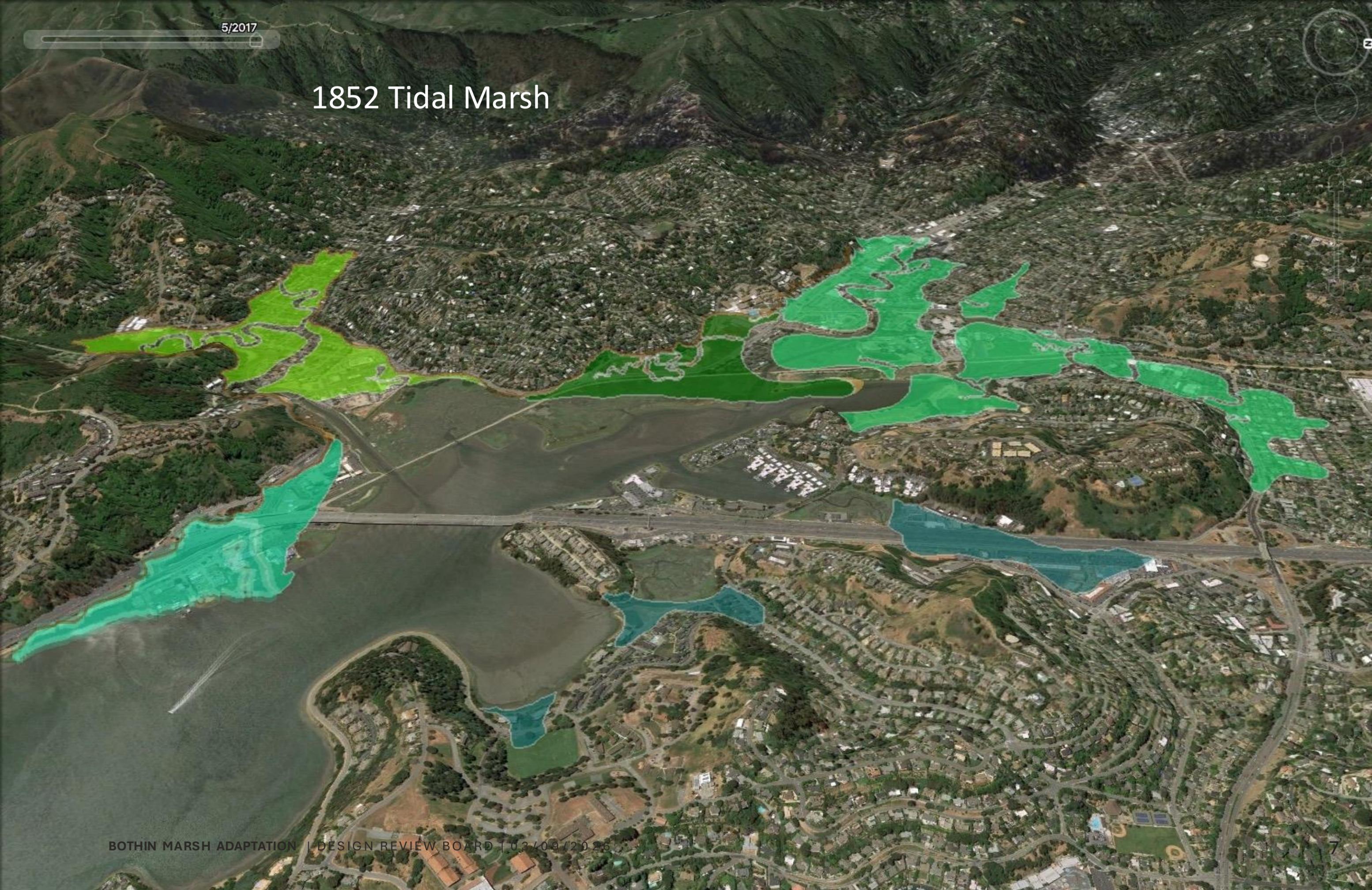
TODAY (SINCE 1987)

NEW BRIDGE RESTORES TIDAL INFLUENCE IN SOUTH BOTHIN MARSH

- HISTORIC BAYLANDS EXTENT 1851
- NEW BAYLANDS EXTENT

Sources:
 Historical maps collected by the team, including: 1851 U.S. Coast Survey, San Francisco Bay, T-00334, NOAA; 1924 (need source); 1946 Aerial Photo, Mill Valley Library History Room; 1968 San Rafael 7.5-minute Quadrangle, USGS; 1987 Aerial Photo, USGS via Google Earth.

1852 Tidal Marsh



2017 Tidal Marsh







EXISTING TRAIL ALIGNMENT



EXISTING TRAIL ALIGNMENT

- Recreational (pedestrian; cyclist; equestrian)
- Active Transportation (commuters; designated Safe Route to School)
- Total visits in 2014: 817,204
- Total visits in 2016: 1,017,985
- 2017 trail counter data:
 - Peak # of Cyclists, 8-10 AM weekdays: 99
 - Avg. # of cyclists, weekends: 1,796
 - Avg. # of pedestrians, daily: 803



PREDICTED SEA LEVEL RISE IMPACTS ON BOTHIN MARSH



TODAY (SINCE 2019)

- Subtidal (<MLLW)
- Mudflat (MLLW-MSL)
- Low-Mid Tidal Marsh (MSL-MHHW)
- High Tidal Marsh (MHHW-HAT)
- 10-Year Coastal Flood
- 100-Year Coastal Flood



2030 +1' SEA LEVEL RISE

IMMEDIATE

The inundation extents shown provide only a rough estimate of the inundation extents that may occur during the indicated flood events. These maps have been developed to inform project planning and may contain errors or inaccuracies. Key processes affecting actual inundation extents have been neglected in this simplified mapping.



2050 +2' SEA LEVEL RISE

NEAR-TERM



2100 +7' SEA LEVEL RISE

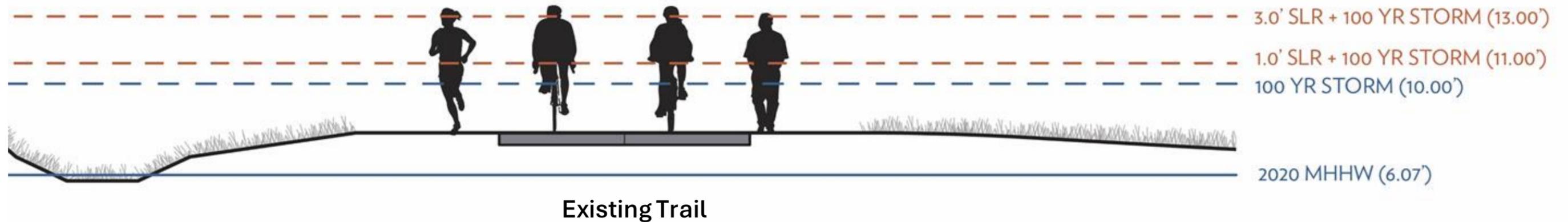
LONG-TERM

Sources: Elevations based on 2019 LiDAR; Tidal datums based on CLE Study; Flood elevations based on FEMA 2017 Flood Insurance Study; SLR Scenarios based on OPC's State of California Sea-Level Rise Guidance, 2018, Table 1: Projected Sea-Level Rise (in feet) for San Francisco, assuming Medium-High Risk Aversion in the High Emissions scenario for 2030, 2050, and 2100.

PREDICTED SEA LEVEL RISE IMPACTS ON THE MILL VALLEY-SAUSALITO PATHWAY

OPC and BCDC SLR Guidance:

- 1.0 ft SLR (2050 Intermediate-High Scenario)
- 3.0 ft SLR (2080 Intermediate-High Scenario)



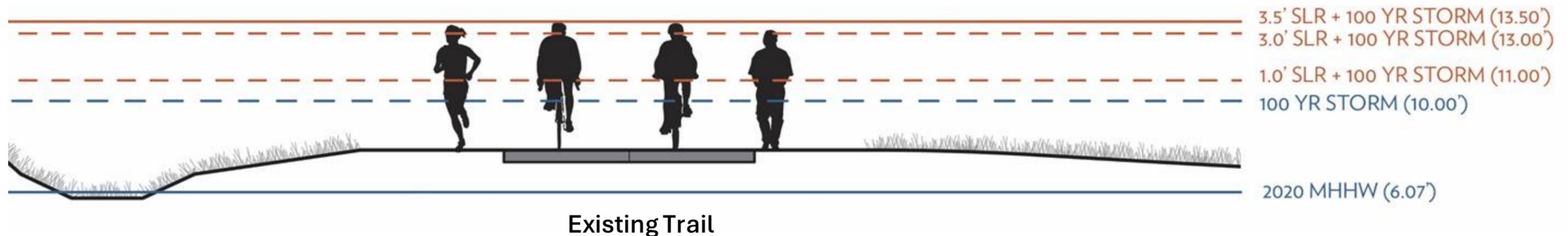
PREDICTED SEA LEVEL RISE IMPACTS ON THE MILL VALLEY-SAUSALITO PATHWAY

OPC and BCDC SLR Guidance:

- 1.0 ft SLR (2050 Intermediate-High Scenario)
- 3.0 ft SLR (2080 Intermediate-High Scenario)

Project Design Elevation:

- 3.5 ft SLR + 100 yr Storm (13.5' NAVD88)



COMMUNITY ENGAGEMENT

Timeline:

- 2018: Community-based visioning for desired future conditions at Bothin Marsh – 24 events leading to direct engagement with 450 community members
- 2020: Conceptual Design Feedback - Presentation and Community Survey – 5 public presentations and 815 survey participants
- 2022-23: Preliminary Design – 22 events and public presentations

Climate and Social Justice focused youth programs hosted at Bothin Marsh:

- Linking Individuals to Natural Communities (LINC)
- Martin Luther King Bayside Academy
- Inspiring Youth Emerging Leaders (IYEL)
- Canal Alliance





ADAPTATION CONCEPT EVALUATION

NO ACTION SCENARIO



1 RAISE THE TRAIL IN PLACE

The trail follows the present-day alignment, but is built up on an embankment to keep pace with sea level rise.



2 SPAN THE MARSH

The trail follows the present-day alignment, but is built up on a causeway structure to span the marsh below.



3 RING THE MARSH

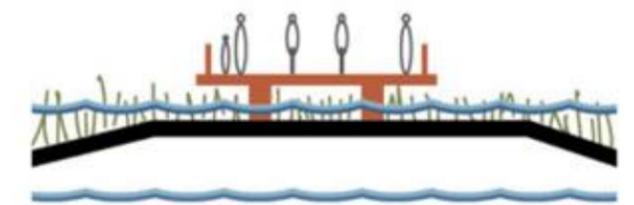
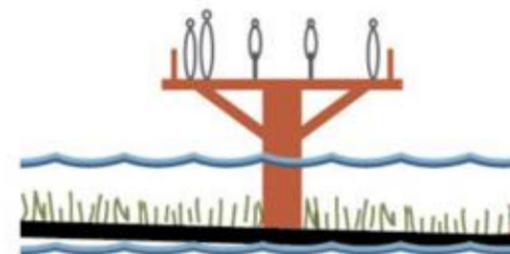
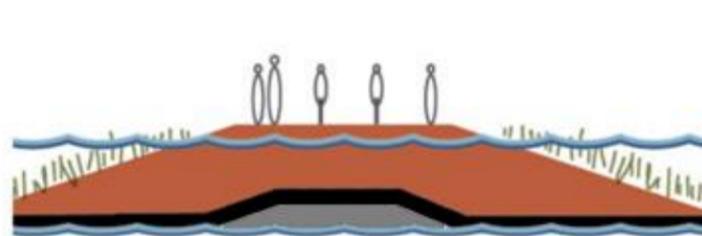
The trail is moved to the edge of the Preserve, allowing the marsh to be reconnected to the bay.



2100 +7' SEA LEVEL RISE

LONG-TERM

- Subtidal (<MLLW)
- Mudflat (MLLW-MSL)
- Low-Mid Tidal Marsh (MSL-MHHW)
- High Tidal Marsh (MHHW-HAT)
- 10-Year Coastal Flood
- 100-Year Coastal Flood



ADAPTATION CONCEPT EVALUATION

OVERVIEW OF CONCEPT EVALUATION

The concept evaluation was organized around the community's values and the defined goals and objectives established in the Vision Document. Across all four categories, "Concept 3: Ring the Marsh" had the greatest potential for public and ecological benefit.



NO ACTION



CONCEPT 1:

RAISE THE TRAIL IN PLACE



CONCEPT 2:

SPAN THE MARSH



CONCEPT 3:

RING THE MARSH

PUBLIC ACCESS



+

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+++++

ECOLOGICAL FUNCTION



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+

+++ ?

+++ ?

COST - DIRECT & RECURRING



n/a

++

++

++

REGIONAL GUIDANCE & REGULATIONS



+

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+++

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COMMUNITY FEEDBACK

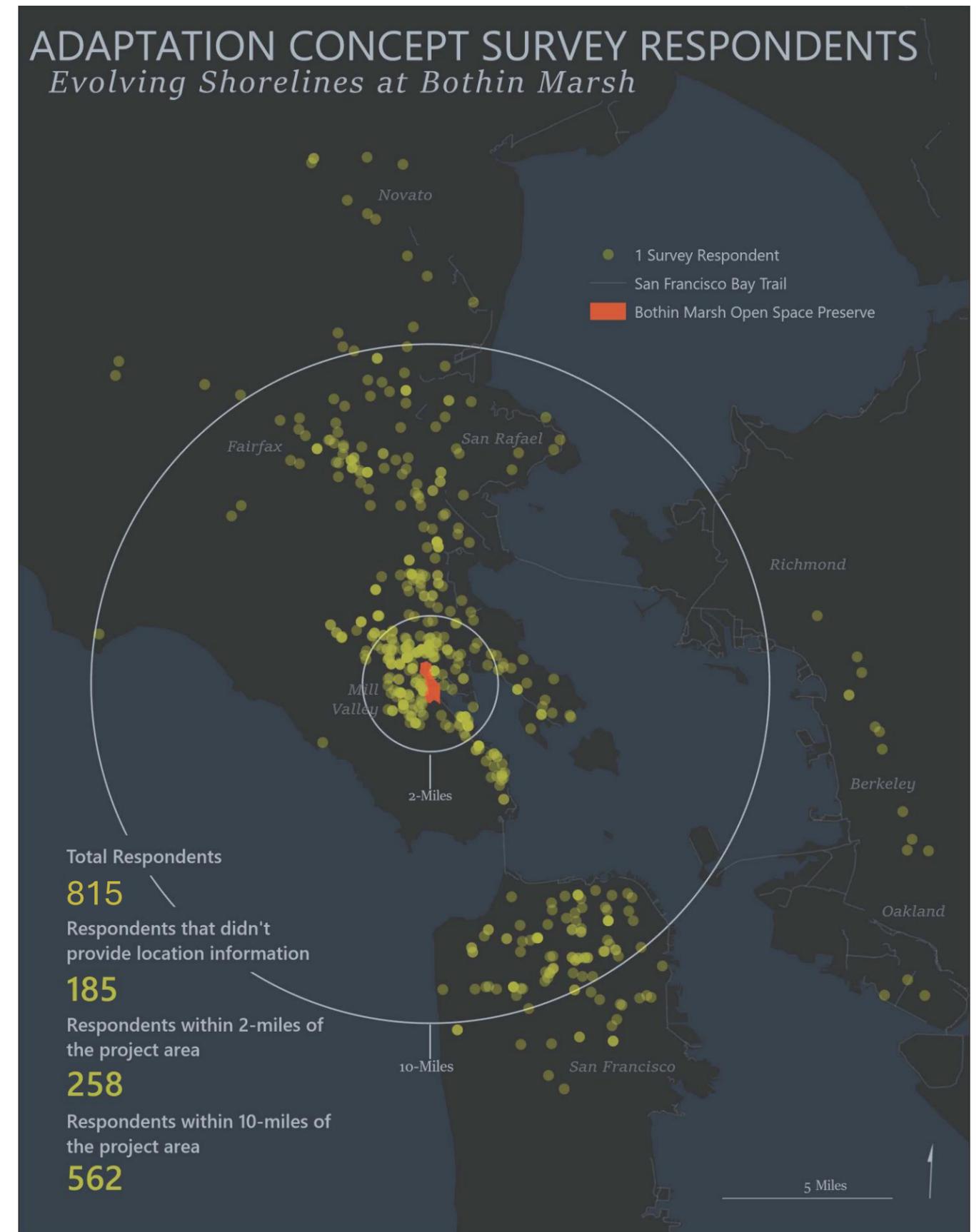
Ring the Marsh is the favored concept

Top Priorities:

- Improve pathway safety for all users (width, surfacing, line-of-sight, etc.)
- Reduce trail flooding
- Maximize the ecological benefits of the project

Key Considerations:

- Maintain views of open space and wildlife
- Protect the trail experience from roads and pollution
- Enhance trail connectivity to the community
- Minimize impacts to public access and habitat during construction
- Responsibly manage costs and align with funding sources



COMMUNITY FEEDBACK

User Experience

- ADA parking, restrooms, seating, and shade will contribute to a welcoming trailhead experience.
- Amenities at the trailhead should not be overbuilt and in balance with restoring habitat.
- Maintaining an immersive experience in the marsh, especially for birding, is important.
- Traffic congestion in the area is a concern.



BOTHIN MARSH OPEN SPACE PRESERVE EVOLVING SHORELINES: FROM PLANNING TO DESIGN

Project Goals/ Design Parameters:

- **Wetland restoration:** Reduce erosion, create high-marsh, and restore natural processes. Restored hydrologic connectivity is key to long term resiliency.
- **Keep trail dry and improve connectivity:** Elevate trail – it will be approximately 6 feet higher than existing. Maintain regional Bay Trail network and increase neighborhood connections.
- **Improve user experience:** Retain shoreline experience. Improve safety with minimum design width of 18'. Maintain separation from roadways.
- **Permittable project:** No net wetland loss or off-site mitigation. Balance public access with restoration.
- **Buildable project:** Construction feasibility. Alignment with regional funding. Community support.



PROPOSED TRAIL ALIGNMENT



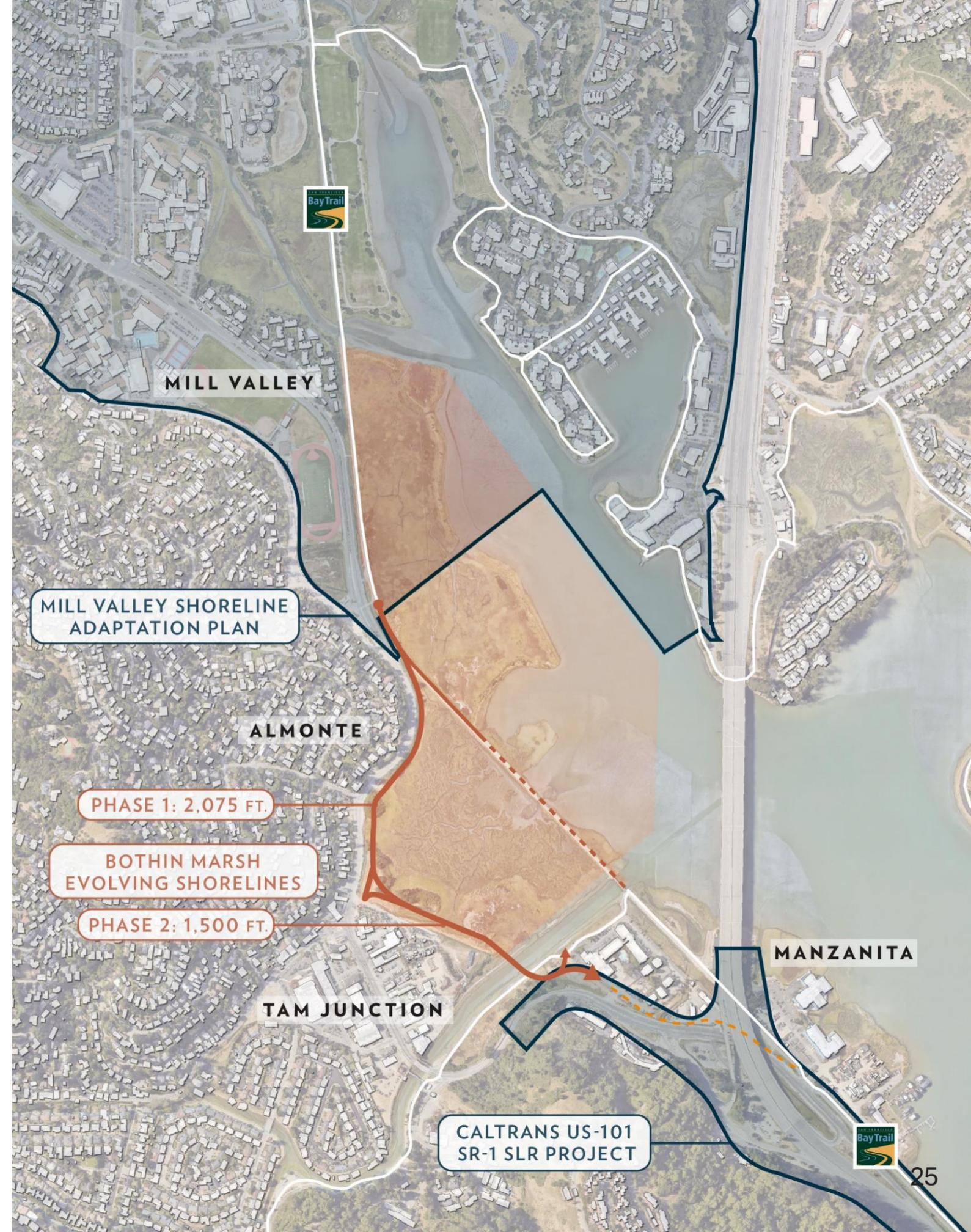
MARSH TRAIL EXPERIENCE



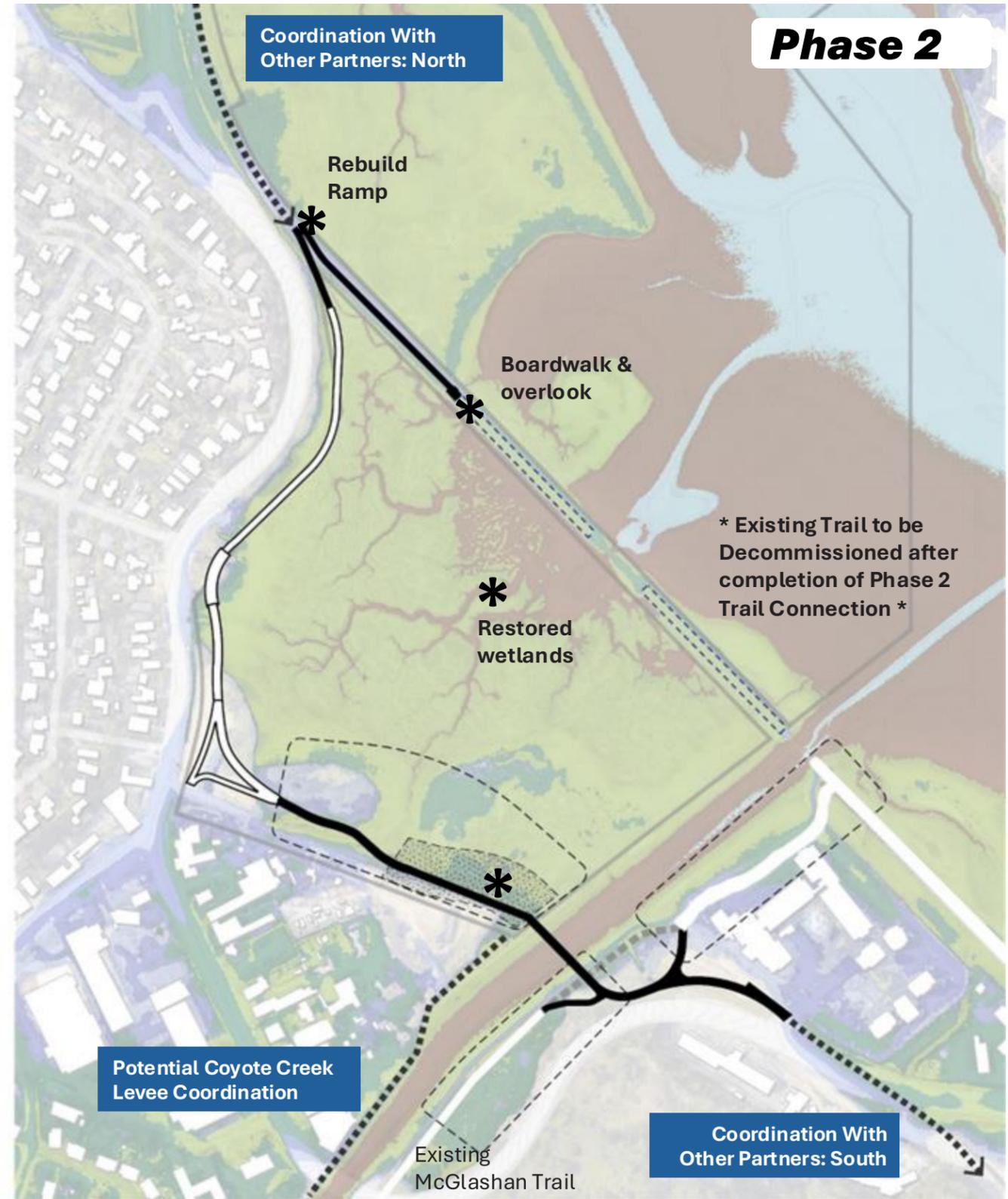
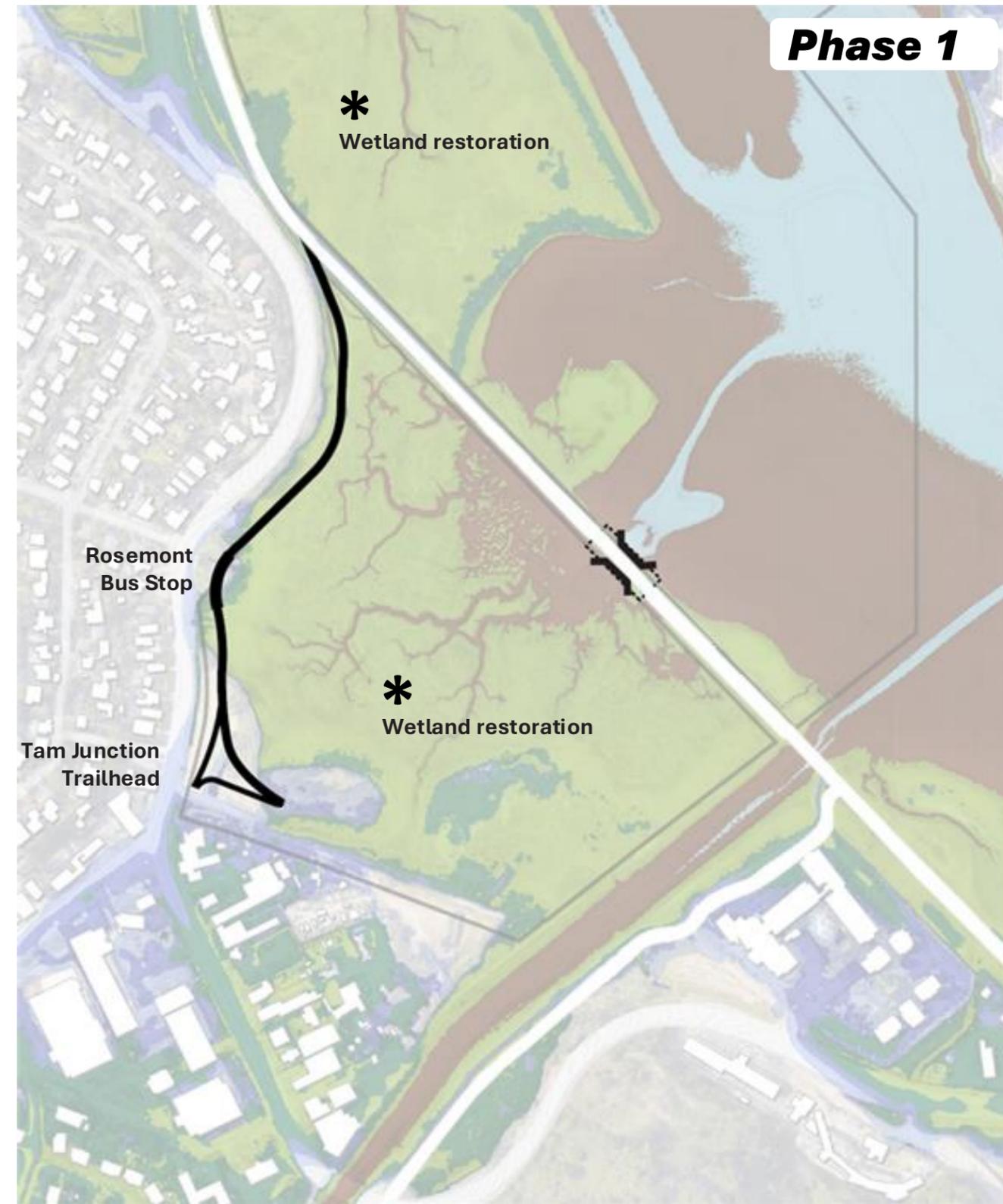
RICHARDSON BAY PHASING

Trail Context Topics:

- Varied timeline of improvements
- Multiple jurisdictions



PROJECT PHASING



PROJECT ELEMENTS

TRAIL AND USER EXPERIENCE

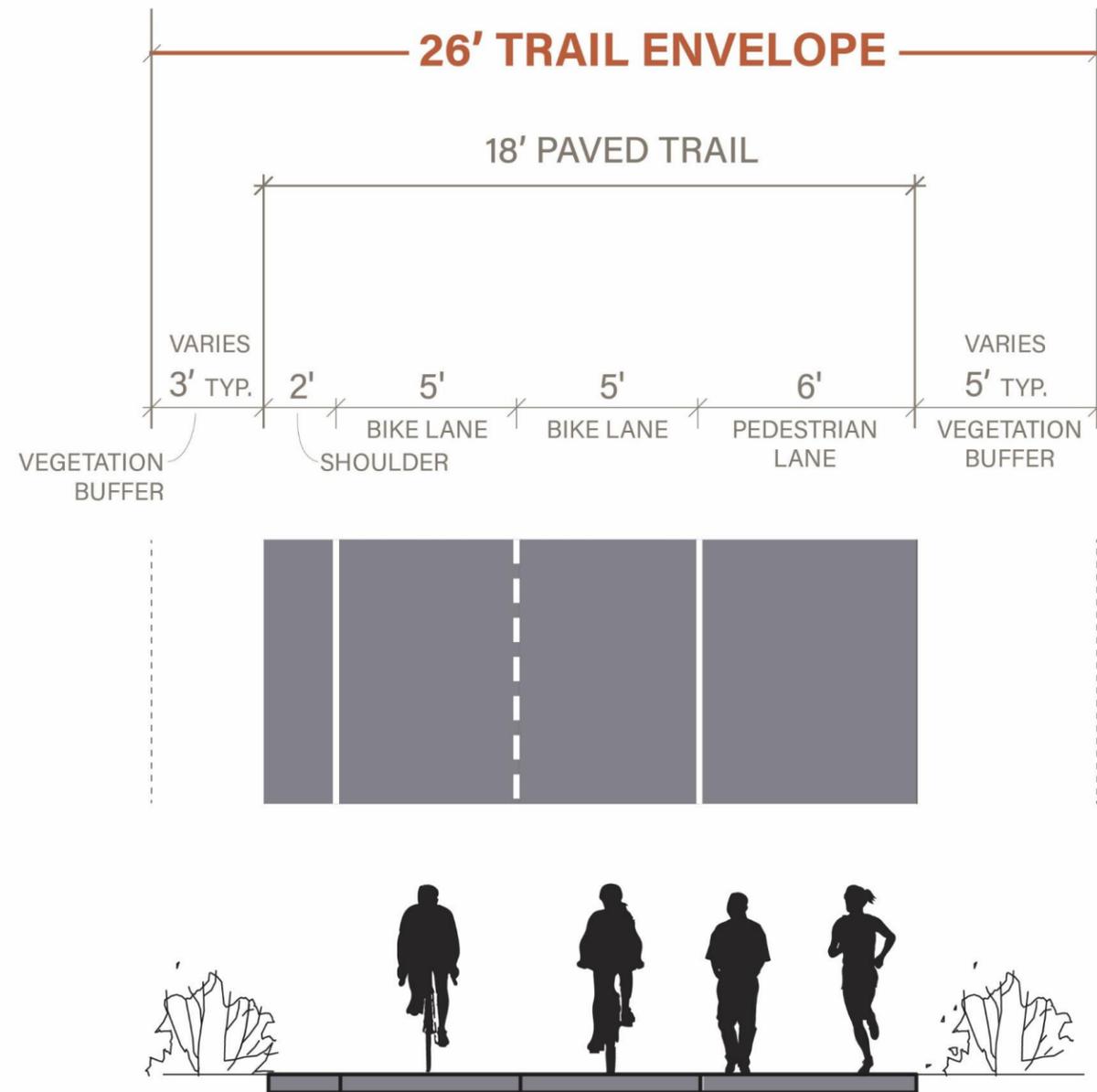
-  1 EXISTING BAY TRAIL
-  2 MILLER AVE TRAILHEAD
-  3 OLD TRAIL OVERLOOK NORTH (PHASE 2)
-  4 ROSEMONT OVERLOOK
-  5 TAM JUNCTION TRAILHEAD
-  6 PROPOSED BAY TRAIL (PHASE 2)
-  7 OLD TRAIL OVERLOOK SOUTH (PHASE 2)

MARSH RESILIENCE

-  1 EXISTING TIDAL CHANNEL
-  2 PROPOSED TIDAL CHANNEL
-  3 TRAIL EMBANKMENT RESTORATION (PHASE 2)
-  4 COARSE BEACH
-  5 EXISTING BRIDGE REMOVAL (PHASE 2)
-  6 POTENTIAL REEF LOCATION
-  7 POTENTIAL THIN LIFT (PHASE 2)
-  8 ECOTONE SLOPE
-  9 HIGH MARSH RESTORATION
-  10 PROPOSED TIDAL CHANNELS (PHASE 2)

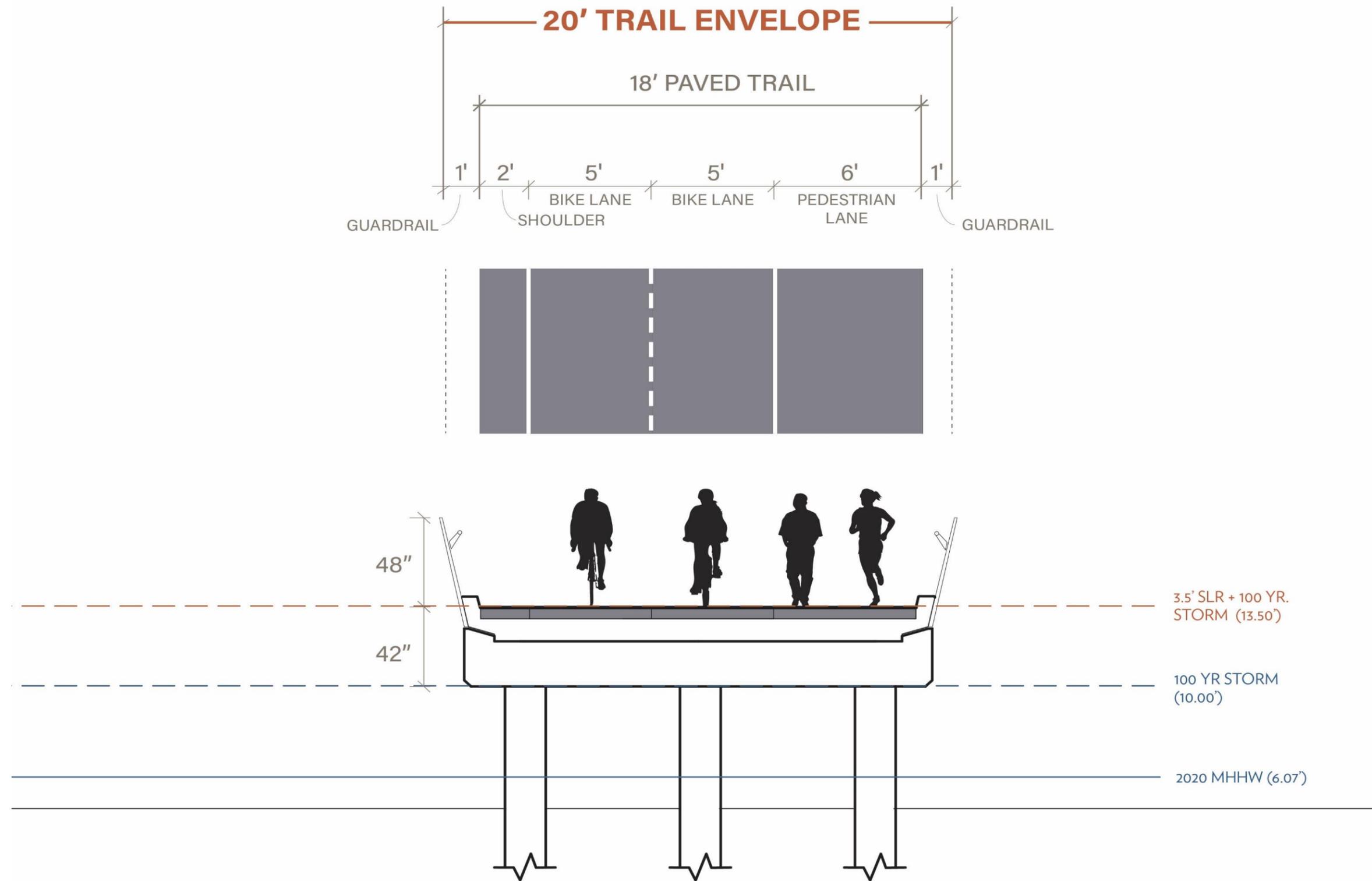


TYPICAL TRAIL SECTION AT GRADE

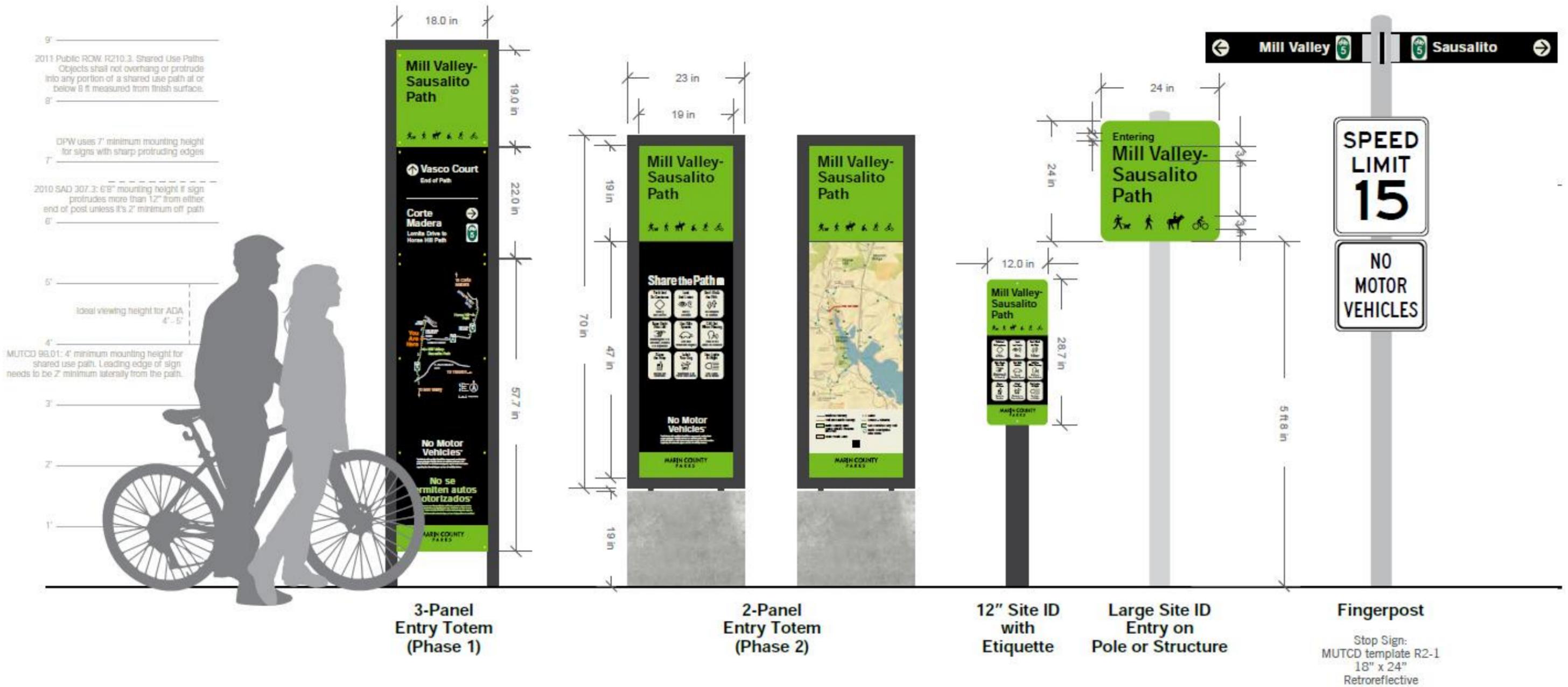


Existing 10' wide trail

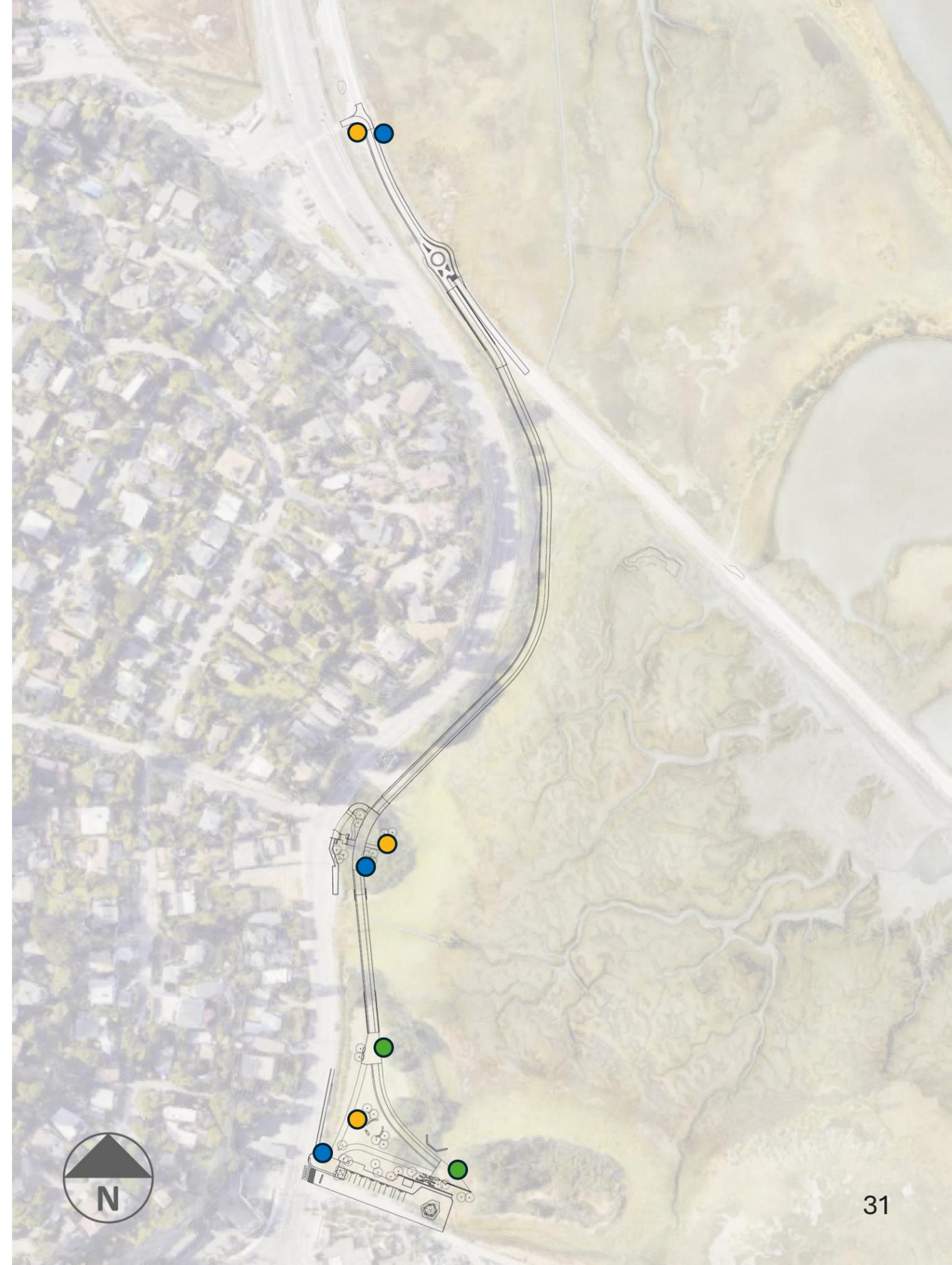
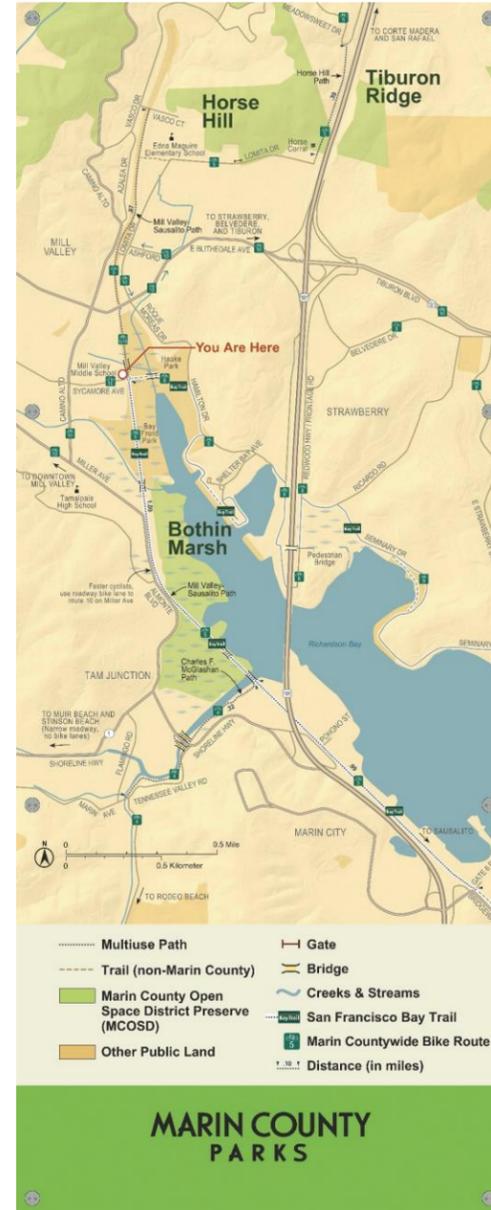
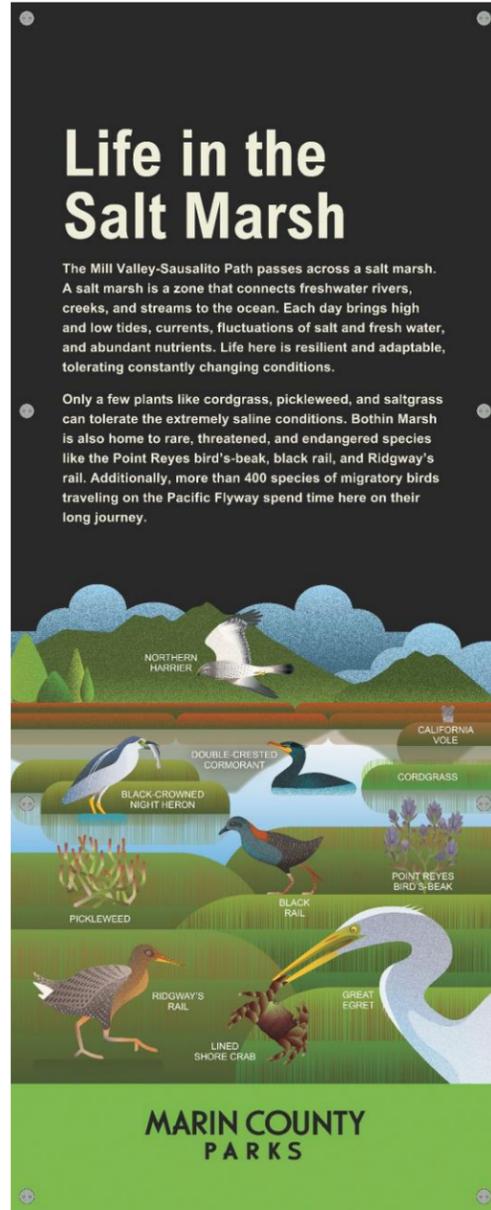
TYPICAL TRAIL SECTION ALONG THE CAUSEWAY STRUCTURE



TRAIL WAYFINDING SIGNAGE FAMILY



PRELIMINARY TRAIL SIGNAGE



● Primary Signage

● Educational Signage

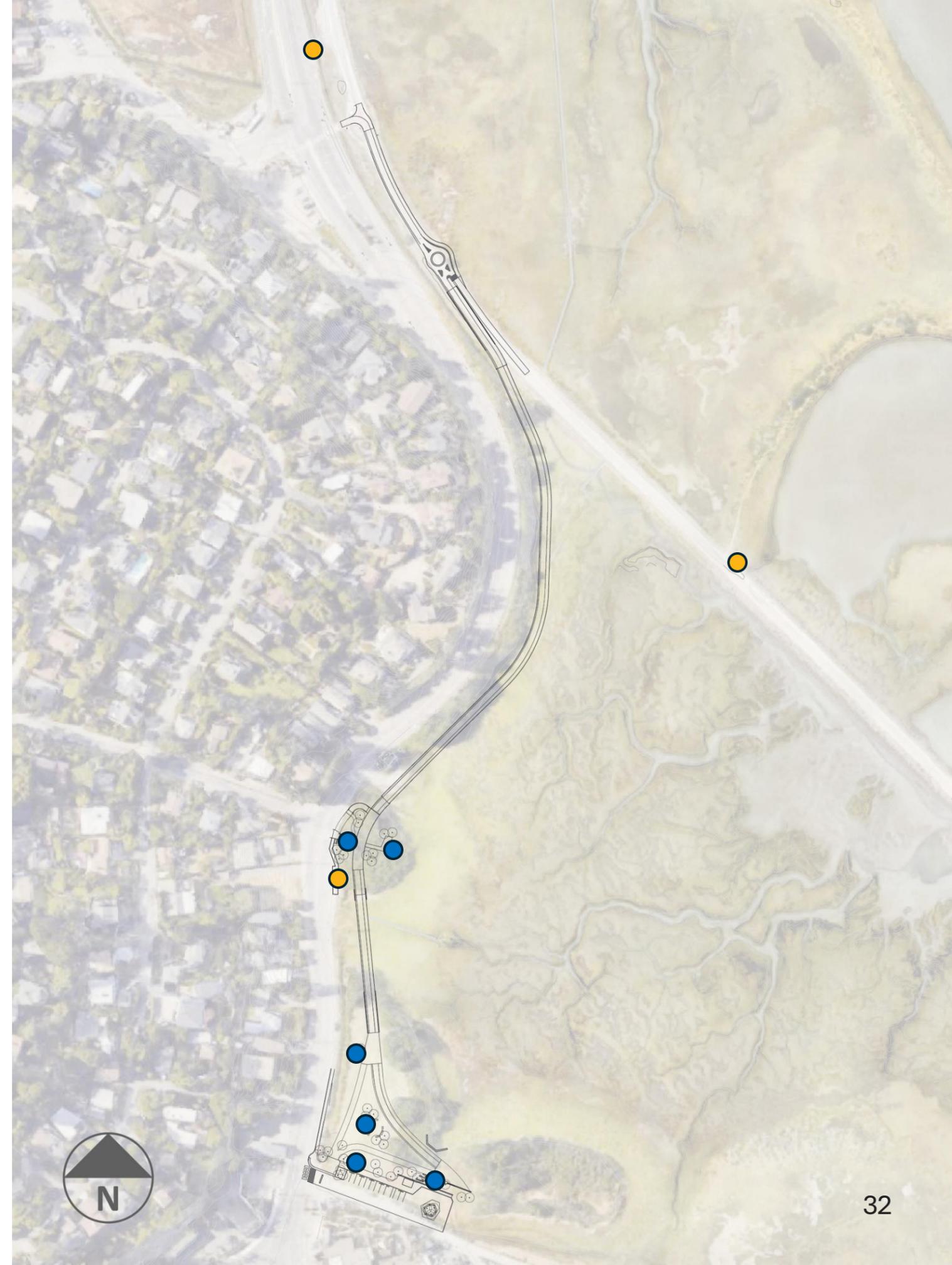
● Directional Signage

PRELIMINARY SEATING



Example of bench with companion seating
(Installed by Marin County Parks MVS path 2017)

- Existing Seating
- Proposed Seating



MILLER AVE TRAILHEAD



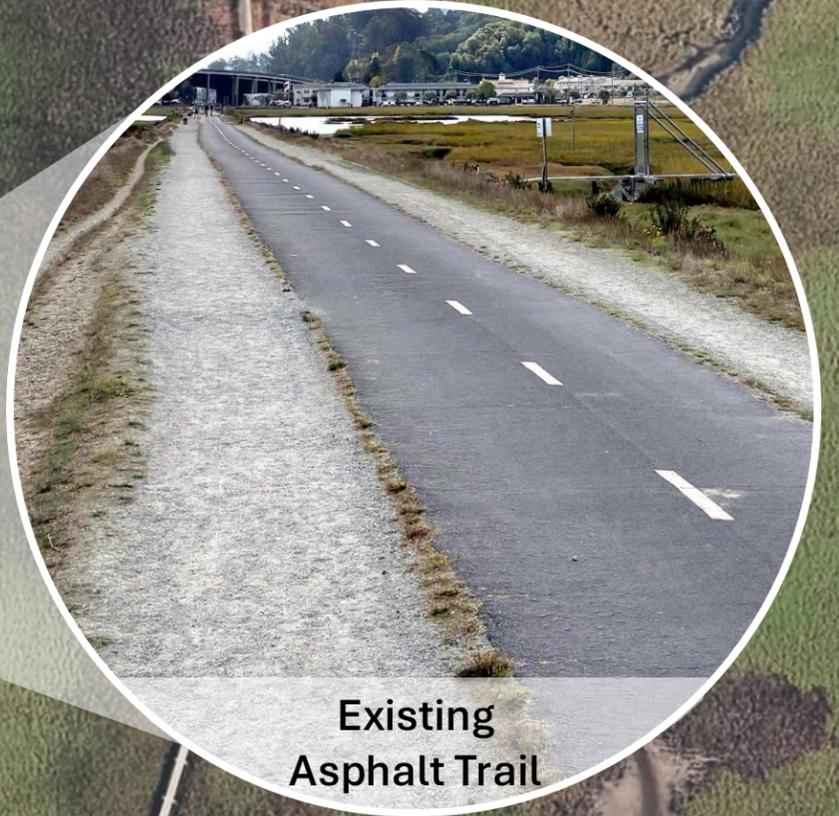
MILLER AVE TRAILHEAD



Miller Ave Trail Connection



Views of Tidal Marsh



Existing Asphalt Trail

MILLER AVE TRAILHEAD



CONNECTION TO MILLER AVE AND EXISTING TRAIL

DELINEATED WETLAND

ROUNDBOUT WITH MOUNTABLE CURB

CONNECTION TO EXISTING MILL VALLEY-SAUSALITO PATH

CONNECTION TO ELEVATED CAUSEWAY

TRAIL RAMP UP TO ELEVATED CAUSEWAY

LEGEND

- CONCRETE PAVING
- ASPHALT
- TEXTURED COLORED ASPHALT
- STABILIZED DECOMPOSED GRANITE
- CONCRETE RETAINING WALL

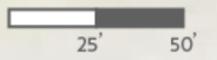
+8.0'

7.5'

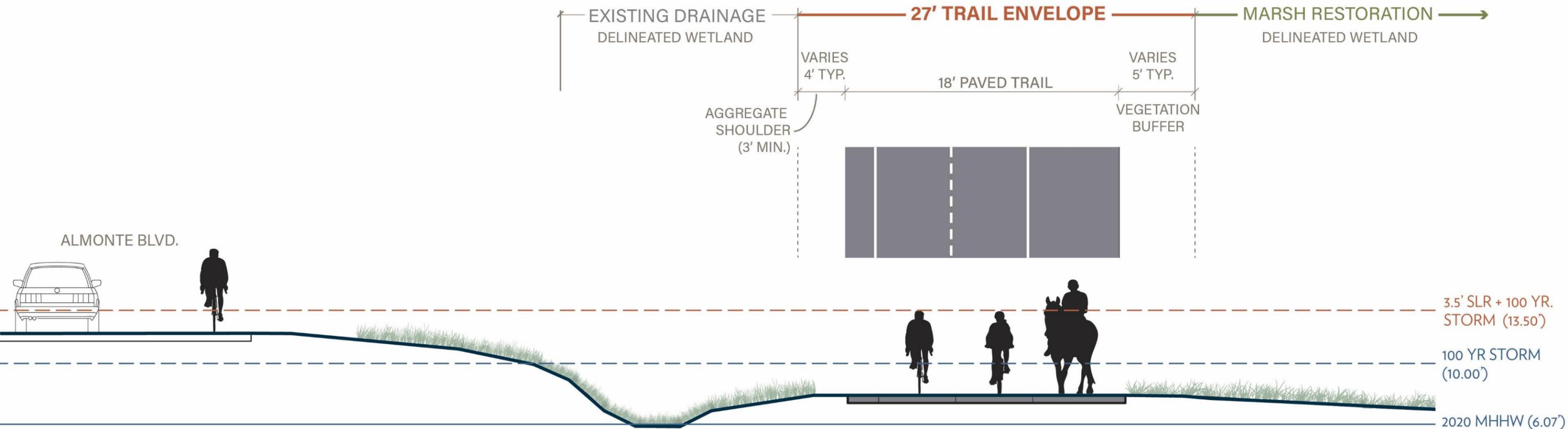
10.0'

13.5'

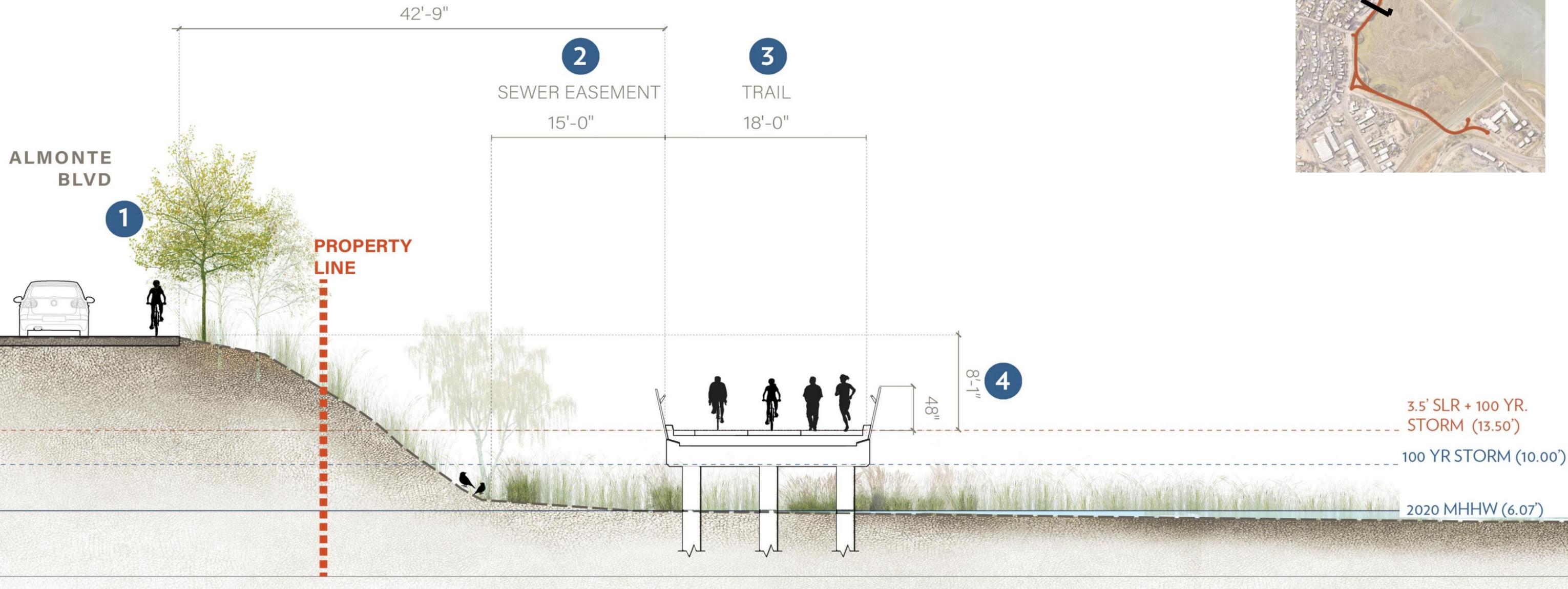
MILLER AVE



MILLER AVE TRAILHEAD



TRAIL SECTION ALONG ALMONTE BLVD



- 1 Existing Bike Lanes To Remain
- 2 Location of SASM Sewer Easement

- 3 Proposed Trail
- 4 Trail Surface approximately 8' Below and 40' Away From Almonte Blvd; 9' Above Marsh

ROSEMONT TRAILHEAD



ROSEMONT TRAILHEAD



Crosswalk at Rosemont Ave



Existing Bus Stop



PG&E Boardwalk



ROSEMONT TRAILHEAD

EXISTING PUMP STATION

BIKE/PEDESTRIAN RAMP WITH HANDRAILS

ROSEMONT AVE

ALMONTE BLVD

OVERLOOK WITH INTERPRETIVE SIGNAGE

DELINEATED WETLAND

EXISTING BUS STOP TO REMAIN

10.0'

+13.5'

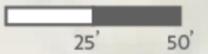
PG&E BOARDWALK CONNECTION

ALMONTE BLVD



LEGEND

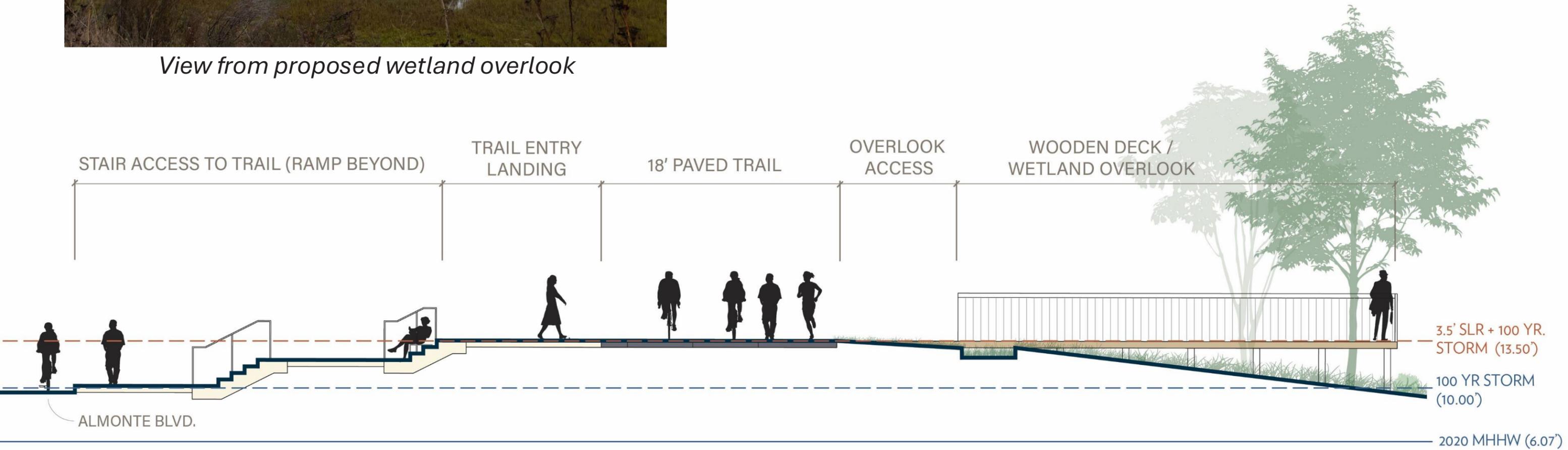
- CONCRETE PAVING
- ASPHALT
- TEXTURED COLORED ASPHALT
- BIORETENTION PLANTING
- WOODEN DECK/ BOARDWALK



ROSEMONT TRAILHEAD



View from proposed wetland overlook



TAM JUNCTION TRAILHEAD



ALMONTE BLVD

HELEN AVE

SHORELINE HWY
INTERSECTION

NATIVE PLANT
NURSERY

INFORMAL PARKING

EXISTING ACCESS DRIVE

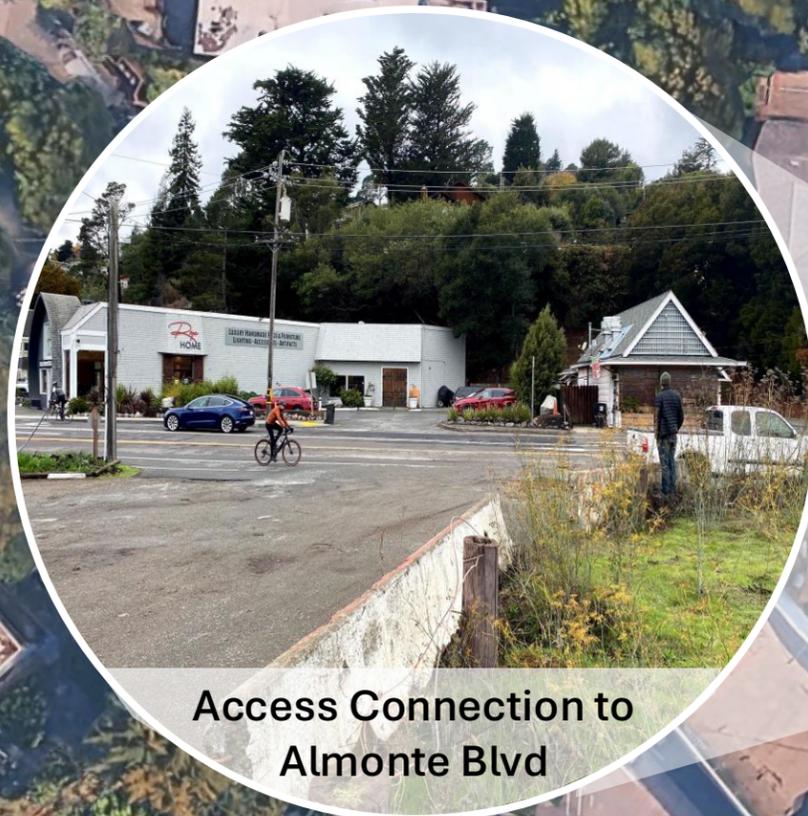


TAM JUNCTION TRAILHEAD



ALMONTE BLVD

HELEN AVE



Access Connection to Almonte Blvd



Informal Parking

INFORMAL PARKING

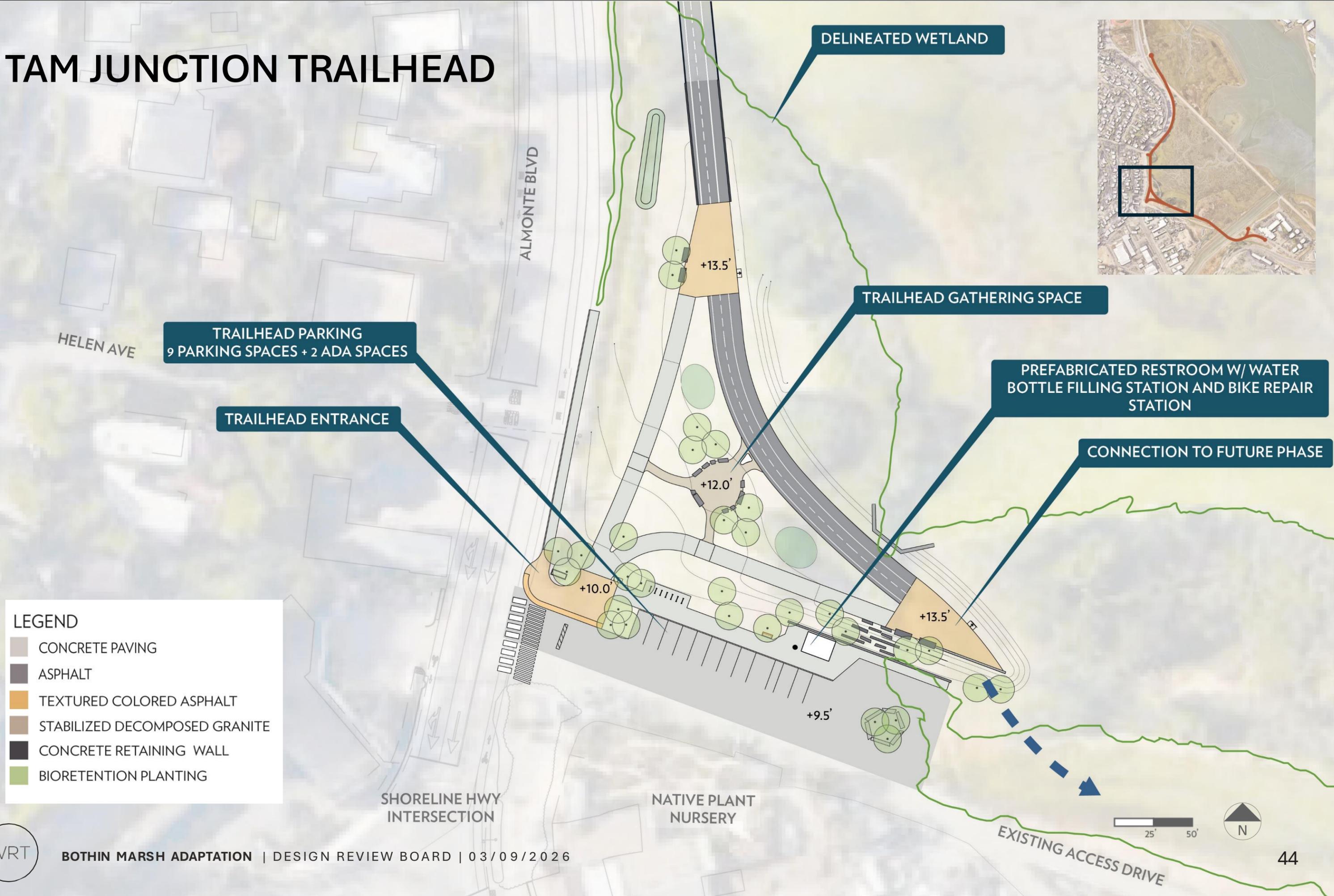
SHORELINE HWY INTERSECTION

NATIVE PLANT NURSERY

EXISTING ACCESS DRIVE



TAM JUNCTION TRAILHEAD



TRAILHEAD PARKING
9 PARKING SPACES + 2 ADA SPACES

TRAILHEAD ENTRANCE

DELINEATED WETLAND

TRAILHEAD GATHERING SPACE

PREFABRICATED RESTROOM W/ WATER BOTTLE FILLING STATION AND BIKE REPAIR STATION

CONNECTION TO FUTURE PHASE

- LEGEND**
- CONCRETE PAVING
 - ASPHALT
 - TEXTURED COLORED ASPHALT
 - STABILIZED DECOMPOSED GRANITE
 - CONCRETE RETAINING WALL
 - BIORETENTION PLANTING

SHORELINE HWY INTERSECTION

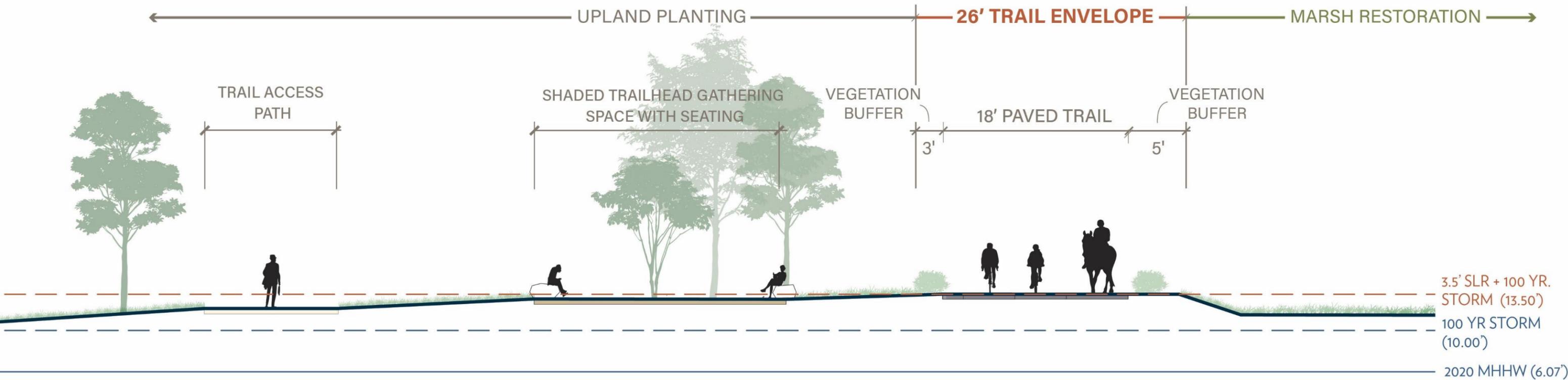
NATIVE PLANT NURSERY



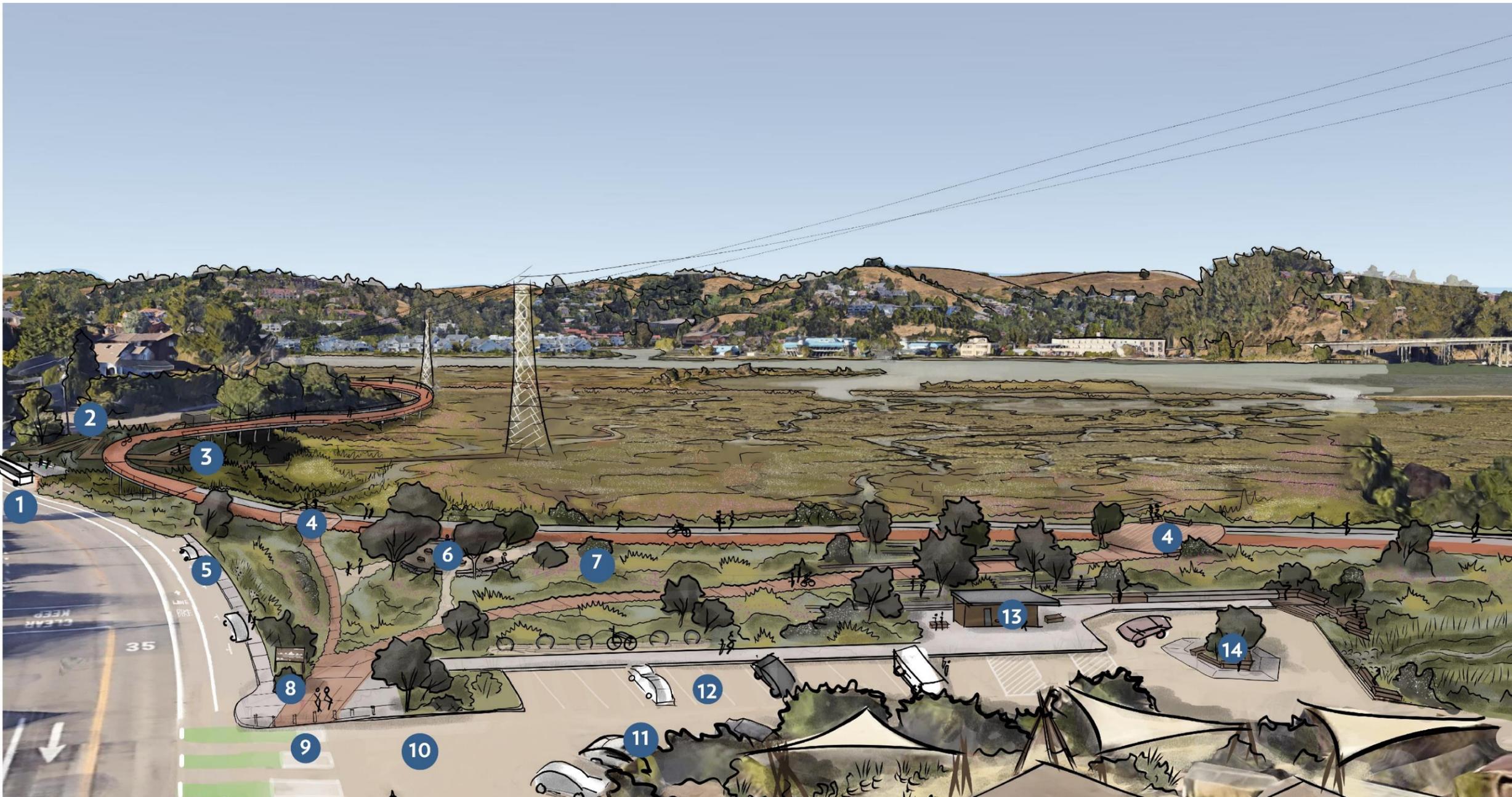
EXISTING ACCESS DRIVE



TAM JUNCTION TRAILHEAD



TAM JUNCTION TRAILHEAD



- 1 EXISTING BUS STOP
- 2 ROSEMONT TRAIL ACCESS
- 3 ROSEMONT OVERLOOK
- 4 TRAFFIC CALMING SURFACE
- 5 IMPROVED PARALLEL PARKING
- 6 INFORMAL GATHERING AREA
- 7 UPLAND RESTORATION PLANTING
- 8 GATEWAY SIGNAGE
- 9 PEDESTRIAN IMPROVEMENTS
- 10 DRIVE AISLE TO REMAIN
- 11 EXISTING PARKING TO REMAIN
- 12 IMPROVED PARKING (12 CARS INCLUDING 2 ADA)
- 13 PREFABRICATED RESTROOM
- 14 CAR TURN-AROUND

TRAIL MATERIALS AND SITE FEATURES



Prefabricated Restroom



Truncated Dome



Textured Color Asphalt



Asphalt Trail



Bike Repair Station



Reclaimed Log Seat



Educational Signage



Wood Bench



Waste Receptacle



Corten Bike Racks



Stepping Stones



Wood Wheel Stoppers



Wooden Deck/Overlook



Removable Bollards



Water Bottle Filling Station

UPLAND COASTAL NATIVE PLANTING *Preliminary examples of typical species*



Quercus agrifolia
Coast Live Oak



Artemisia californica
California Sagebrush



Ceanothus hearst
Hearst's Ceonothus



Elymus triticoides
Creeping Wild Rye



Baccharus pilularis
Coyote Bush



Epilobium canum
California Fuchsia



Erigeron glaucus
Seaside Daisy



Juncus patens
California Grey Rush



Rhamnus californica 'San Bruno'
California Coffeeberry



Eriogonum fasciculatum
California Buckwheat

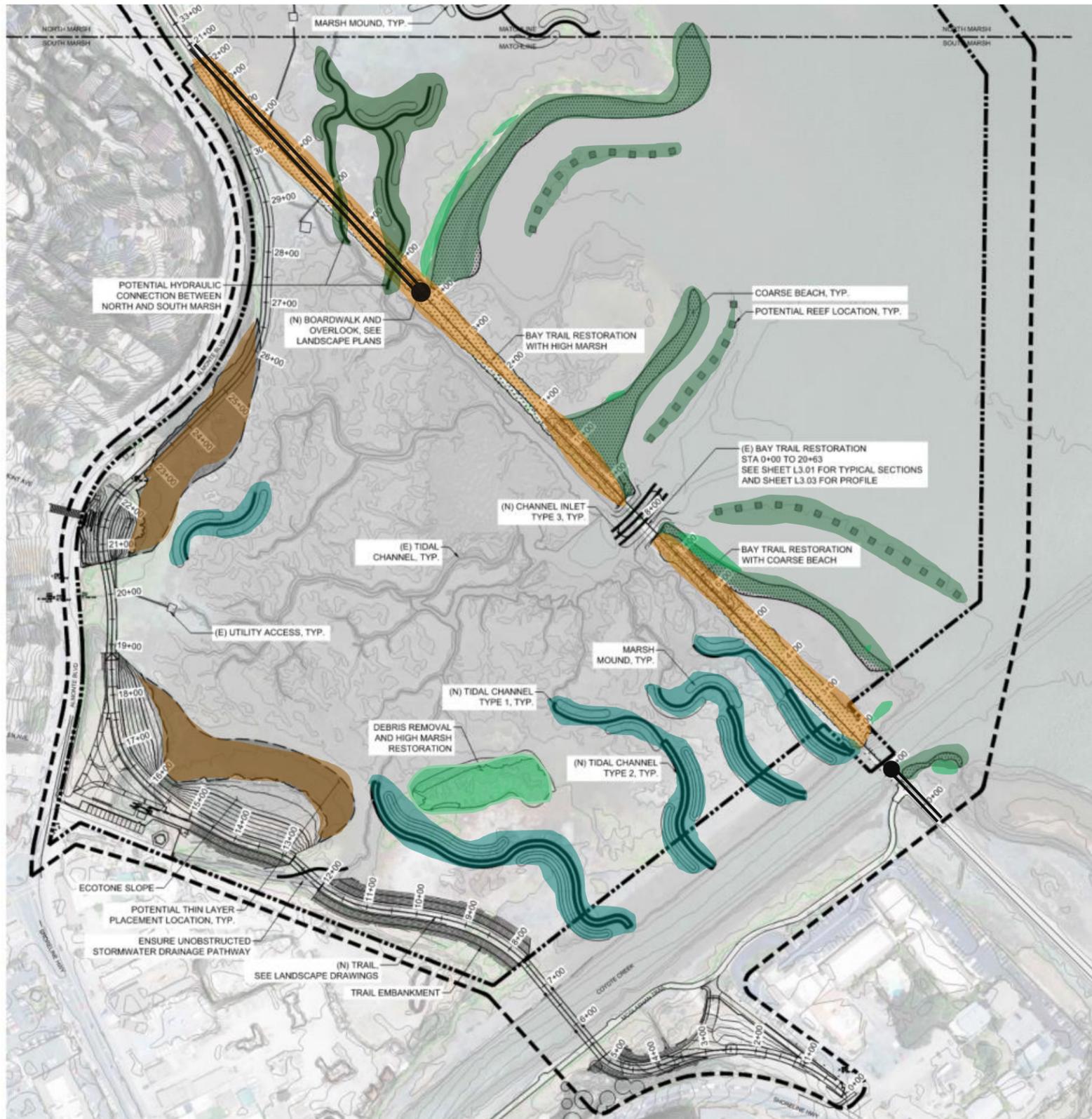


Muhlenbergia rigens
Deergrass



Carex praegracilis
Clustered Field Sedge

MARSH HABITAT RESTORATION ELEMENTS



Tidal Marsh Mound



Coarse Beach



Reef Element

- Tidal Marsh Channel and Mounds
- Shoreline Resiliency Measures
- Sediment placement
- Bay trail deconstruction and restoration
- Native plants

PUBLIC ACCESS ALONG EVOLVING SHORELINES...

