

**Follow Up from Stakeholder Meeting #2:
Planning Horizons, Road Corridor Goal, Implementation Feasibility
Considerations, First Draft Compilation of Adaptation Alternatives**

China Camp State Park Road Project

Request for Stakeholder Input

March 25, 2019

The San Francisco Bay National Estuarine Research Reserve (SF Bay NERR) thanks everyone for their input at the February 19, 2019 stakeholder meeting for the China Camp Road Adaptation Project.

The purpose of this memo is to **seek specific, individual input** on three items from that meeting. We ask that you provide your feedback on the following by **April 5, 2019**. Please email feedback to siegel@sfsu.edu and aimee@sfsu.edu.

- 1) Updated Project Goals, to reflect planning horizons and the road corridor goal
- 2) Our first pass at combining all the brainstorming ideas provided at and after the meeting into Adaptation Alternatives
- 3) Updated Implementation Feasibility Criteria, to add several items

Following your input, we will make any adjustments necessary based on the collective feedback and then we will embark upon the Adaptation Alternatives evaluation effort.

Green highlight indicates items on which we are asking for your specific feedback.

Topic 1: Goals - Adding Planning Horizons, Updating Road Corridor

Goals express intended outcomes. They serve two purposes for this planning process: 1) they help us brainstorm adaptation options (which you have done a great job of) and 2) they are used in the next step of this process to evaluate alternatives (i.e., the extent to which goals are achieved by a specific alternative).

Table 1 presents the updated road adaptation goals and states the stakeholder feedback sought at this stage of the project. Explanations of the changes follow the table.

Table 1. Updated Road Adaptation Goals

Goal	Feedback Sought Via This Memo
Recreation – Maintain functionality of and access to China Camp State Park recreational resources	None – group concurrence
Natural Resources – Protect and enhance all natural resources of China Camp State Park, especially marsh habitats along North San Pedro Road	None – group concurrence
(Updated) Road Corridor Preservation – In the face of sea-level rise:	
(delete existing language) Maintain a viable corridor for vehicles travelling through and within China Camp State Park	Proposed to be replaced in its entirety
(replace with proposed language) <u>Maintain an alignment of North San Pedro Road as a through road corridor between Peacock Gap and Santa Venetia that supports:</u>	This proposed language explicitly defines specific uses, services and geographies. It allows clarity on how alternatives are evaluated, including specifically about alignment choices.
1) <u>Recreation access to China Camp State Park</u>	This language means vehicular access effectively equal to current conditions
2) <u>Commuting</u>	This language means daily commute road relatively similar to current conditions
3) <u>Evacuation</u>	This language means vehicular transit out of each neighborhood to 101 on the “other side” of China Camp State Park
4) <u>Emergency Response Alternate Route(s)</u>	This language means emergency responders have relatively “fast” transit corridor around Point San Pedro as alternate route to 101 and Los Ranchitos/Lincoln
(Added) Sea Level Rise Adaptation	
(proposed language) Provide a road corridor that functions <ol style="list-style-type: none"> 1) In the medium term (to ~2050) and three (3) feet of sea level rise and 2) To the extent practical, in the longer term (to ~2100) and seven (7) feet of sea level rise and with both time frames also accommodate the 1 percent (100 year) storm event.	This proposed language intends to capture medium- and long-term planning horizons and adaptability of the adaptation. Note that it is entirely possible some alternatives viable in the medium term may be viability-challenged in the long term.

How We Arrived at the Proposed Sea Level Rise Planning Horizon Goal

We had a fruitful discussion at the Feb 19, 2019 stakeholder meeting around the concepts of land use planning time horizons and sea level rise planning horizons. Much of that conversation was around the

planning horizon that seems feasible to address at the present while keeping a clear focus on long-term sea level rise projections.

There are four elements, described below, that informed how we developed the planning horizon goal: 1) time periods and associated sea level rise and storm planning targets, 2) a fresh reminder from the late February 2019 road flooding that storms cause road flooding separate from high tides, 3) minimizing road adaptation environmental impacts, and 4) continuity of the entire Point San Pedro-North San Pedro road corridor.

1. Planning horizon time frames discussed at the February 19, 2019 meeting

At the February 19, 2019 stakeholder meeting, we discussed “medium-term” and “longer-term” planning horizons. Table 2 presents the key planning attributes of those two time periods.

Table 2. Medium- and Longer-Term Planning Horizon Attributes for China Camp Road

Attributes of Planning Horizon	Medium Term Horizon	Longer Term Horizon
Time period ¹	Now to about 2050 (~30 years)	About 2050 to 2100 (~30-80 years)
Sea level rise projection used here ²	3 feet	7 feet
Storm event planning ³	1 percent (100 year)	1 percent (100 year)

Notes:

1. *Obtaining permits requires consideration of project functionality at 2100.*
2. *For 2050, BCDC stated they ask applicants to use 1.9 feet of sea level rise. The group adopted the higher 3 ft target, to be more cautious with prospective sea level rise projections relative to the implementation cost of actions.*
3. *BCDC stated that they require accounting for storm flows. Note that in February 2019, the road flooded extensively from local watershed runoff and those storms were not as large as the 1 percent (100 year) storm.*

2. A Reminder from late February 2019 that storms cause flooding separate from high tides

Recent storms gave us the opportunity to see that storms also cause road flooding, not just high tides: a reminder of why BCDC requires addressing storm flows for its permits. See Box 1 for stormwater flooding of the road on February 27, 2019.

Box 1: Watershed flooding morning of February 27, 2019. Photos at 9 am.



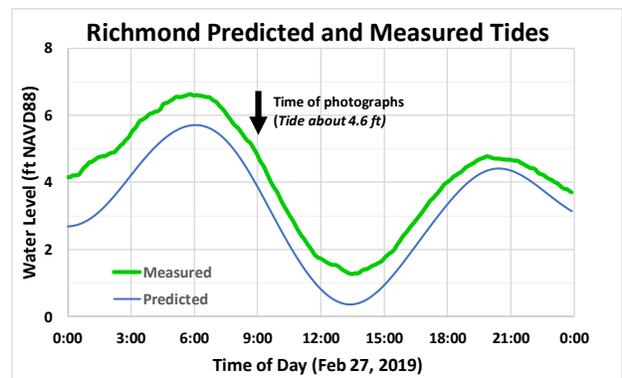
Watershed runoff at Back Ranch Road. State Parks reported about a foot of sediment deposition in the marsh higher up near campground.



(1) Watershed flows flooding over road at Back Ranch Road culvert. (2) Tidal slough water level well below the road. (3) Extensive ponding inland of road. (4) Culvert was gurgling loudly from its outflows.



(1) Flooding debris across road in front of Boyd property west of State Park entrance. (2) High pond water level.



Tide level at time of photographs (9am Feb 27, 2019), as measured at National Ocean Service Richmond station.

All photos by Stuart Siegel, SF Bay NERR

3. Minimizing Road Adaptation Environmental Impacts

The SF Bay NERR has followed up with State Parks regarding their organizational planning documents and considerations. In this “planning horizon time frame” context, State Parks General Plan for China Camp identifies protection of the ancient tidal marsh as its top priority. Further, State Parks has clear policy guidance to minimize such impacts and District staff have expressed concern about potential impacts to tidal marsh in the event that there is a medium-term solution to the road and a subsequent different longer-term solution that requires a new suite of future implementation impacts. State Parks needs to see alternatives considered that can evolve with changes and avoid the potential of repeated implementation impacts. Selecting a route for the medium term that would be relocated for the long term would be a good example of repeated environmental impacts. This concern amplifies the feasibility criterion of “adaptability of the adaptation”.

4. Continuity of the Entire Point San Pedro Road-North San Pedro Road Corridor

One key issue that arose for these planning time horizons, and that is beyond the scope of this current effort, is the need for a separate planning effort to examine the entirety of the road corridor around all of Point San Pedro from Central San Rafael to the Civic Center. The reason is that there are other low sections of road and thus modifying the road through China Camp alone does not solve the larger road corridor sea level rise adaptation needs. That effort would combine efforts of the City of San Rafael and Marin County as well as many additional stakeholders. NERR has since reached out to the City of San Rafael conveying this input and we are expanding their representation in this stakeholder group beyond Public Works and Emergency Response to include their Planning Department, so as to help set the stage for these future discussions.

Basis of Refining Road Corridor Adaptation Goal

The Feb 19, 2019 stakeholder meeting made clear that divergent perspectives around the Road Corridor goal exists. This process is intended to reflect everyone's perspectives and accept that divergence may exist.

The proposed refinement to the goal wording is intended to establish the *purposes / services* of the road corridor and the *places* it connects explicitly. The goal is intentionally agnostic to road locations and instead allows these purposes, services and geographies to guide what the alternatives evaluation will be able to identify as meeting, not meeting, or partially meeting this goal. In the next step of this planning process, we will evaluate *all* alternatives put forward for consideration against this and the other goals. That evaluation can only start once the stakeholder group has resolved the wording of this goal. It is important to recognize that some or even all alternatives proposed may fail to meet one or more goals, and shedding light on such a finding is a key purpose of the evaluation.

Please comment on the modified road corridor goal language in Table 1 on page 2.

One comment about commuting, evacuation, and emergency responder uses: On the morning of March 13, 2019, a big-rig truck crashed on Point San Pedro Road near Balboa Avenue and knocked down power lines, resulting in closure of both directions for several hours during the morning commute and beyond. The location of this accident is one of several where there are no local rerouting options. Drivers were thus required to go through China Camp State Park to bypass the accident (Figure 1). This incident highlights the role of North San Pedro Road through China Camp as an important road corridor.

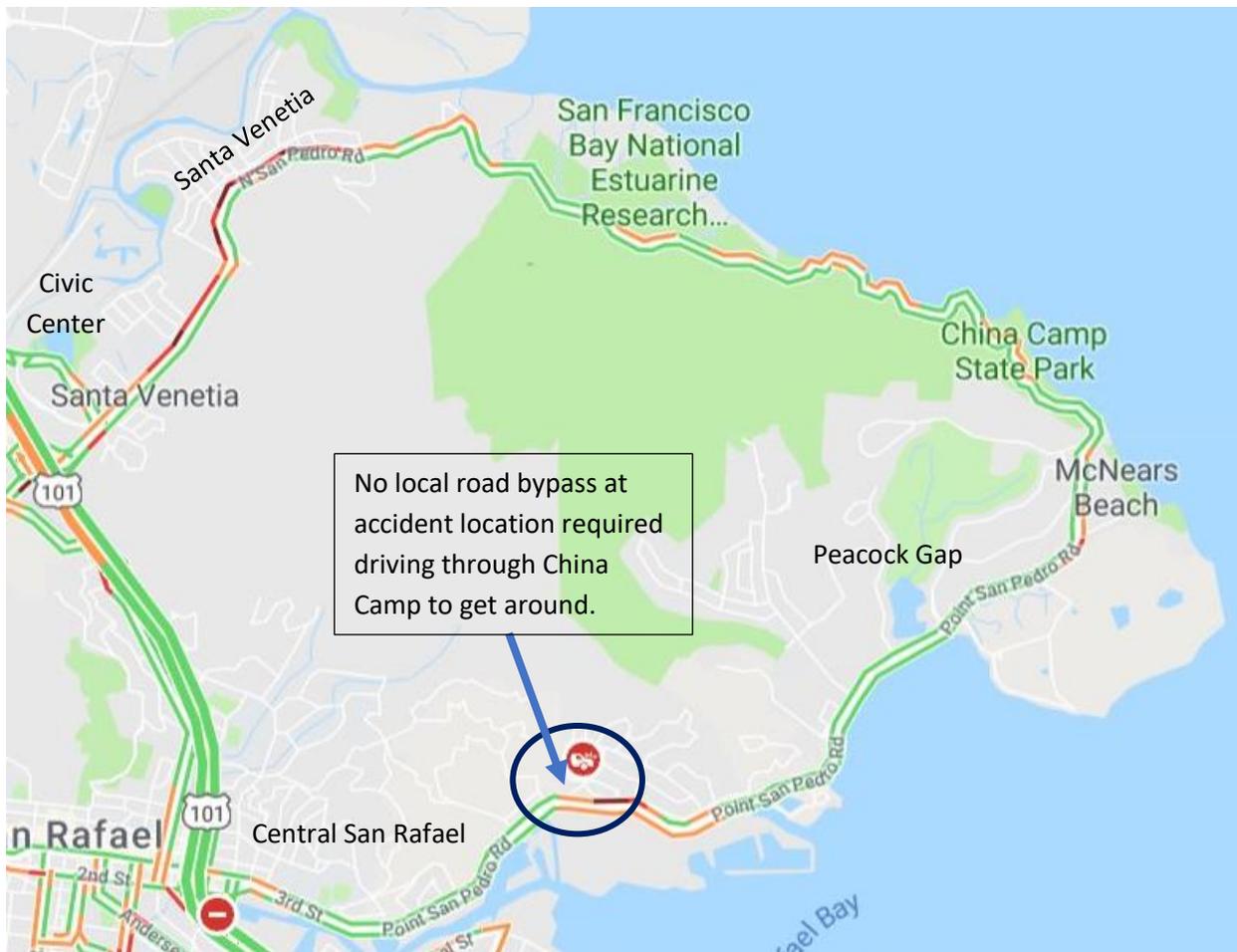


Figure 1. Google Maps traffic map at 9:34 am, March 13, 2019. Accident first reported via Nixle alert at 8:17am, both directions reported open at 3:44pm via Nixle alert.

Topic 2: Road Adaptation Options

We have combined the brainstorming ideas put forward during the February 19 meeting and input provided following the meeting into six alternatives plus a “no action” alternative (presented below but not prioritized). In support of these alternatives, stakeholders identified specific features that should reasonably be common to several or all of the options (described after the alternatives).

All stakeholders are asked to provide feedback on 1) do these six alternatives effectively capture all the ideas expressed? 2) are there any ideas expressed that we did not capture? 3) do the descriptions provide adequate explanations so that we are all clear on what each alternative means?

Alternative 1: Raise Road on Current Alignment via Solid Fill

- Fill could be earthen or perhaps in combination with lightweight fill or other technology to offset the need for deep foundations which increase project costs.

- Culverts replaced and enlarged at current locations, could be arch, box, etc. Details about culvert sizing and how they would integrate with a raised road have not been developed.
- Vehicle lanes and pedestrian and bicycle paths as narrow as possible, to minimize fill. Variances may be needed from standard road specifications.
- Inclusion of pedestrian and bike lane on at least one side.
- Possible inclusion of “turnouts” for public access, viewpoints, interpretation, etc.
- Possible design as single-lane road with light signal control (like Headlands tunnel) plus pedestrian and bike lane, to minimize fill extent.
- Possible combination of higher culverts at outset with lower road, to minimize fill and accommodate longer-term adaptation. Possible use of rise and dips as a form of “speed reducer”.

Alternative 2: Raise Road on Current Alignment via Pile-Supported Causeway

- Likely to be designed to higher sea level rise target than 3 feet, due to high cost driving need to ensure longer life cycle
- Culverts would be unnecessary
- Lanes as narrow as possible, to minimize volume and footprint of fill and to minimize extent of structures needed to support roadway
- Inclusion of pedestrian and bike lane on at least one side
- Possible inclusion of “turnouts” for public access, viewpoints, interpretation, etc.
- Possible design as single-lane road with light signal control (like Headlands tunnel) plus pedestrian and bike lane, to minimize volume and footprint of fill and to minimize extent of structures needed to support roadway

Alternative 3: The “Low Road” Relocation Around Back Ranch and/or Miwok Meadows

- The road relocation would be along a low-elevation contour, above long-term sea level projections. In essence, it would be similar to the remainder of the road through the Park that hugs the bluff.
- This alternative could include relocating around Miwok Meadows and/or Back Ranch.
- The relocated road would utilize Back Ranch campground and Miwok Meadows access roads and shoreline trail to the extent possible. Exact routes have not been identified.
- Alignments anticipated to require some combination of hillside cuts, fill placement, retaining walls, and related road engineering elements including possible exemptions to road standards such as sight distances and curvature.
- May include short bridges or causeways and/or culverts to cross lower reaches of watersheds.
- Fate of low-lying shoreline road reaches: *see below*.
- Relocating some displaced trails will likely be necessary where a road alignment would overlap an existing trail.
- This routing is at least in part within the tribal and archaeological resource sensitivity areas of the Park.

Alternative 4: The “Middle Road” Reroute Higher up Within the Park and its Watershed

- Follow a route higher up the hillside from that considered in Alternative 3, but still within the existing watersheds of China Camp State Park.
- The location of such a route has not been examined. By staying within the watershed, it would not be an over-the-ridge route. This route would include the road climbing the hill from the shoreline road up to whatever elevation the relocated road is placed at.
- Alignments would require some combination of hillside cuts, fill placement, retaining walls, and related road engineering elements including possible exemptions to road standards such as sight distances and curvature.
- May include short bridges, causeways and/or large culverts at creek crossings.
- Fate of low-lying shoreline road reaches: *see below*.
- Relocating some displaced trails and/or adding trail crossings would likely be necessary.
- This routing is at least in part within the tribal and archaeological resource sensitivity areas of the Park.

Alternative 5: The “High Road” Reroute Over the Ridge

- Follow a route over Point San Pedro Mountain that utilizes existing residential and fire roads to greatest extent possible
- Start and end points have not been established and thus how those points align with the Peacock Gap and Santa Venetia neighborhoods has not been established
- Fate of low-lying shoreline road reaches: *see below*.

Alternative 6: Floating Roadway (Details not discussed at stakeholder meetings. The following are prospective elements)

- Anchor floating road structure to uplands at ends of each low-lying reach
- Research engineering design options for floating roads capable of supporting existing levels and types of vehicle use
- Very adaptive

Alternative 7: No Action – Allow Existing Road to Deteriorate and Be Abandoned, No Replacement Road

- This alternative includes “basic” level of County investment in maintaining the current road configuration, without raising the road, enlarging any of the culverts, and so forth. The County would keep the road at its current level of “maintenance priority” relative to all the other roads it maintains.
- Tidal and storm flooding of the road would continue and increase in frequency. Flooding damage to the road would continue.
- At some indeterminate time, road and/or culvert deterioration and/or frequency of flooding will result in road temporary/indefinite/permanent closure.

Fate of the Decommissioned Existing Road, Alternatives 3, 4 and 5

These three alternatives all involve intentionally decommissioning some or all of the low-lying sections of road. The fate of the decommissioned sections would have to be determined.

- Decommissioned sections of road would be closed to vehicular traffic once maintaining its current condition becomes infeasible for Marin County in the face of external drivers such as sea-level rise.
- Interests expressed for converting decommissioned road reaches:
 - Preserve as pedestrian and bicycle path. May require constructing boardwalks across low-lying reaches.
 - Restore and enhance tidal marsh
 - Remove or enlarge culverts depending on how designed

Elements Likely Common to Most or All “Action” Alternatives

There are a number of design elements that would be “added” onto most or all of these alternatives depending on how specific configurations would play out. Essentially, these elements incorporate the principle of “promote multi-benefit opportunities.” Stakeholders identified these elements in the online survey response ahead of the November 2018 meeting, at the November 30, 2018 meeting, and at the February 19, 2019 meeting. This list is not necessarily complete and additions welcome.

- Provide replacement parking for lost shoulder parking (this could be either within China Camp State Park as allowed by the park General Plan, or potentially outside of the park)
- Protect and enhance watershed, wetland, and riparian areas
- Allow for, if necessary, infrequent, short-duration road closures from extreme tide and storm events (similar to existing condition)
- Enhance fire roads and trails elsewhere at China Camp State Park where they may be impacted by implementation of whichever adaptation solution is adopted.

Topic 3: Implementation Feasibility Considerations

Implementation feasibility considerations address a range of issues that affect the ease or difficulty of implementing any particular strategy. We will be using these considerations as part of vetting adaptation alternatives, alongside project goals.

All stakeholders are asked to provide feedback with a focus on bullet points added during and after the February 19, 2019 stakeholder meeting (Table 3). Feedback on those previously presented is fine if anyone has comments that were not raised at the February meeting.

Table 3. Implementation Feasibility Criteria Updates

Implementation Feasibility Consideration	Timing of Inclusion
<ul style="list-style-type: none"> • Implementation costs (this embodies engineering considerations as well as other implementation costs such as mitigation) • Long-term operations and maintenance requirements and costs (County would like to see cost avoidance or minimization) • Permitting ease or complexity • Protection of natural resources and extent of potential mitigation needs • Protection of cultural resources (note that in general, archaeologists have identified lower elevations of China Camp as more likely to have cultural resources requiring protection) • Consistency with State Parks missions of recreation and natural resource protection 	Presented at Nov 30, 2018 stakeholder meeting
<ul style="list-style-type: none"> • Comparative carbon footprints of adaptation strategies • Adaptability of adaptation strategies 	Added at the Nov 30, 2018 stakeholder meeting
<ul style="list-style-type: none"> • Maximize environmental benefits to greatest extent practical • Avoid any growth-inducing impacts 	Added at the Feb 19, 2019 stakeholder meeting
<ul style="list-style-type: none"> • Need for relocating and/or crossing recreational trails • Review and approval of landowners 	Added after the Feb 19, 2019 stakeholder meeting