

San Francisco Bay Conservation and Development Commission

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FOLLOW-UP DISCUSSION ITEM

December 14, 2016

TO: Bay Fill Working Group Committee Members

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SUBJECT: Gray to Green Infrastructure Policy Background
(For Bay Fill Work Group consideration on December 15, 2016)

Background

Mr. Len Materman, Executive Director of the San Francisco Bay Area Joint Powers Authority (SFCJPA), will brief the Bay Fill Working Group on its SAFER Bay Project. The SFCJPA is regional government agency that plans, designs and implements capital projects that are comprehensive in both geography and function because they cross jurisdictional boundaries, and protect vulnerable populations against flooding, including from projected sea level rise; and foster and restore healthy ecosystems, and connect communities by enhancing trails. SAFER Bay, is a sub-regional approach to protecting multiple adjacent city and county residents and industry from rising Bay waters and fluvial flooding. This strategy makes use of levees behind restored tidal marshes, horizontal levees and other features.

In preparation for this meeting and discussion, staff has provided the applicable policies from the San Francisco Bay Plan and highlighted excerpts are likely applicable to proposals such as SAFER Bay.

Questions for the work group to consider:

1. Should the Commission consider policies specifically to address large shoreline projects that may affect connectivity between upland areas and the Bay?
2. Would projects such as this limit the marshes ability to transgress as Bay waters rise?
3. How would projects such as this affect the region's ability to provide public access to the Bay and its recreational use?
4. How would a large shoreline protection project affect visual access to the Bay?

San Francisco Bay Plan Policies

As with the review of policies for projects affecting low lying areas, there are no Bay Plan policies that specifically address a project that places green and gray infrastructure the interface between the Bay and adjacent upland areas. However, the following policies may affect the Commission's review of such a project.

Scope Of Authority

Protection of the Bay and enhancement of its shoreline are inseparable parts of the Bay Plan. Clearly what happens to the shoreline helps determine what happens to the Bay; if, for example, the relatively few shoreline areas suitable for water-oriented industry are used for housing, pressures will develop to provide new industrial land by filling the Bay. Therefore, in the public interest, the Commission is authorized to control both: (1) Bay filling and dredging, and (2) Bay-related shoreline development.

Developing the Bay and Shoreline to The Highest Potential

3. **Purposes for Which a Permit for Shoreline Development May Be Issued.** The Commission should approve a permit for shoreline development if the agency specifically determines that the proposed project is in accordance with the standards listed below for (a) use of the shoreline, (b) provision of public access, and (c) advisory review of appearance.
 - a. Use of Shoreline
 1. **Priority Uses.** The Commission has designated on the Plan maps those areas, which should be reserved for priority land uses on the Bay shoreline. Within those areas, in accordance with provisions of the McAteerPetris Act, the Commission has set and described the specific boundaries of the 100-foot shoreline band within which it is authorized to grant or deny permits for shoreline development. Permits for development within the priority boundary areas of the 100-foot shoreline band should be granted or denied based on the appropriate Bay Plan development policies:
 - a. Ports
 - b. Water-related Industry
 - c. Water-oriented Recreation
 - d. Airports
 - e. Wildlife Refuges
 2. **All Other Shoreline Areas** should be used in any manner that would not adversely affect enjoyment of the Bay and shoreline by residents, employees, and visitors within the area itself or within adjacent areas of the Bay and shoreline, in accordance with the policies for Other Uses of the Bay and Shoreline. The McAteer-Petris Act specifies that for areas outside the priority use boundaries, the Commission may deny a permit application for a proposed project only on the grounds that the project fails to provide maximum feasible public access to the Bay and shoreline consistent with the project.

Water Quality

1. Bay water pollution should be prevented to the greatest extent feasible. The Bay's tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible, restored and increased to protect and improve water quality. Fresh water inflow into the Bay should be maintained at a level adequate to protect Bay resources and beneficial uses.
2. Water quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay as identified in the San Francisco Bay Regional Water Quality Control Board's Water Quality Control Plan, San Francisco Bay Basin and should be protected from all harmful or potentially harmful pollutants. The policies, recommendations, decisions, advice and authority of the State Water Resources Control Board and the Regional Board, should be the basis for carrying out the Commission's water quality responsibilities.
7. Whenever practicable, native vegetation buffer areas should be provided as part of a project to control pollutants from entering the Bay, and vegetation should be substituted for rock riprap, concrete, or other hard surface shoreline and bank erosion control methods where appropriate and practicable.

Tidal Marsh and Tidal Flats

1. Tidal marshes and tidal flats should be conserved to the fullest possible extent. Filling, diking, and dredging projects that would substantially harm tidal marshes or tidal flats should be allowed only for purposes that provide substantial public benefits and only if there is no feasible alternative.
2. Any proposed fill, diking, or dredging project should be thoroughly evaluated to determine the effect of the project on tidal marshes and tidal flats, and designed to minimize, and if feasible, avoid any harmful effects.
3. Projects should be sited and designed to avoid, or if avoidance is infeasible, minimize adverse impacts on any transition zone present between tidal and upland habitats. Where a transition zone does not exist and it is feasible and ecologically appropriate, shoreline projects should be designed to provide a transition zone between tidal and upland habitats.
6. Any ecosystem restoration project should include clear and specific long-term and short-term biological and physical goals, and success criteria, and a monitoring program to assess the sustainability of the project. Design and evaluation of the project should include an analysis of: (a) how the system's adaptive capacity can be enhanced so that it is resilient to sea level rise and climate change; (b) the impact of the project on the Bay's sediment budget; (c) localized sediment erosion and accretion; (d) the role of tidal flows; (e) potential invasive species introduction, spread, and their control; (f) rates of colonization by vegetation; (g) the expected use of the site by fish, other aquatic organisms and wildlife; (h) an appropriate

buffer, where feasible, between shoreline development and habitats to protect wildlife and provide space for marsh migration as sea level rises; and (i) site characterization. If success criteria are not met, appropriate adaptive measures should be taken. [if a portion of the project is restoration]

Fresh Water Flow

1. Diversions of fresh water should not reduce the inflow into the Bay to the point of damaging the oxygen content of the Bay, the flushing of the Bay, or the ability of the Bay to support existing wildlife.

Climate Change

1. The Commission intends that the Bay Plan Climate Change findings and policies will be used as follows:
 - a. The findings and policies apply only to projects and activities located within the following areas: San Francisco Bay, the 100-foot shoreline band, salt ponds, managed wetlands, and certain waterways, as these areas are described in Government Code section 66610, and the Suisun Marsh, as this area is described in Public Resources Code section 29101;
 - b. For projects or activities that are located partly within the areas described in subparagraph a and partly outside such area, the findings and policies apply only to those activities or that portion of the project within the areas described in subparagraph a;
 - c. For the purposes of implementing the federal Coastal Zone Management Act, the findings and policies do not apply to projects and activities located outside the areas described in subparagraph a, even if those projects or activities may otherwise be subject to consistency review pursuant to the federal Coastal Zone Management Act; and
 - d. For purposes of implementing the California Environmental Quality Act, the findings and policies are not applicable portions of the Bay Plan for purposes of CEQA Guideline 15125(d) for projects and activities outside the areas described in subparagraph a and, therefore, a discussion of whether such proposed projects or activities are consistent with the policies is not required in environmental documents.
2. When planning shoreline areas or designing larger shoreline projects, a risk assessment should be prepared by a qualified engineer and should be based on the estimated 100-year flood elevation that takes into account the best estimates of future sea level rise and current flood protection and planned flood protection that will be funded and constructed when needed to provide protection for the proposed project or shoreline area. A range of sea level rise projections for mid-century and end of century based on the best scientific data available should be used in the risk assessment. Inundation maps used for the risk assessment should be prepared under the direction of a qualified engineer. The risk assessment should identify all types of potential flooding, degrees of uncertainty, consequences of defense failure, and risks to existing habitat from proposed flood protection devices.

3. To protect public safety and ecosystem services, within areas that a risk assessment determines are vulnerable to future shoreline flooding that threatens public safety, all projects—other than repairs of existing facilities, small projects that do not increase risks to public safety, interim projects and infill projects within existing urbanized areas—should be designed to be resilient to a mid-century sea level rise projection. If it is likely the project will remain in place longer than mid-century, an adaptive management plan should be developed to address the long-term impacts that will arise based on a risk assessment using the best available science-based projection for sea level rise at the end of the century.
4. To address the regional adverse impacts of climate change, undeveloped areas that are both vulnerable to future flooding and currently sustain significant habitats or species, or possess conditions that make the areas especially suitable for ecosystem enhancement, should be given special consideration for preservation and habitat enhancement and should be encouraged to be used for those purposes.
5. Wherever feasible and appropriate, effective, innovative sea level rise adaptation approaches should be encouraged.
6. The Commission, in collaboration with the Joint Policy Committee, other regional, state and federal agencies, local governments, and the general public, should formulate a regional sea level rise adaptation strategy for protecting critical developed shoreline areas and natural ecosystems, enhancing the resilience of Bay and shoreline systems and increasing their adaptive capacity.

The Commission recommends that: (1) the strategy incorporate an adaptive management approach; (2) the strategy be consistent with the goals of SB 375 and the principles of the California Climate Adaptation Strategy; (3) the strategy be updated regularly to reflect changing conditions and scientific information and include maps of shoreline areas that are vulnerable to flooding based on projections of future sea level rise and shoreline flooding; (4) the maps be prepared under the direction of a qualified engineer and regularly updated in consultation with government agencies with authority over flood protection; and (5) particular attention be given to identifying and encouraging the development of long-term regional flood protection strategies that may be beyond the fiscal resources of individual local agencies.

Ideally, the regional strategy will determine where and how existing development should be protected and infill development encouraged, where new development should be permitted, and where existing development should eventually be removed to allow the Bay to migrate inland. The entities that formulate the regional strategy are encouraged to consider the following strategies and goals:

- a. advance regional public safety and economic prosperity by protecting: (i) existing development that provides regionally significant benefits; (ii) new shoreline development that is consistent with other Bay Plan policies; and (iii) infrastructure that is crucial to

- public health or the region's economy, such as airports, ports, regional transportation, wastewater treatment facilities, major parks, recreational areas and trails;
- b. enhance the Bay ecosystem by identifying areas where tidal wetlands and tidal flats can migrate landward; assuring adequate volumes of sediment for marsh accretion; identifying conservation areas that should be considered for acquisition, preservation or enhancement; developing and planning for flood protection; and maintaining sufficient transitional habitat and upland buffer areas around tidal wetlands;
 - c. integrate the protection of existing and future shoreline development with the enhancement of the Bay ecosystem, such as by using feasible shoreline protection measures that incorporate natural Bay habitat for flood control and erosion prevention;
 - d. encourage innovative approaches to sea level rise adaptation;
 - e. identify a framework for integrating the adaptation responses of multiple government agencies;
 - f. integrate regional mitigation measures designed to reduce greenhouse gas emissions with regional adaptation measures designed to address the unavoidable impacts of climate change;
 - g. address environmental justice and social equity issues;
 - h. integrate hazard mitigation and emergency preparedness planning with adaptation planning by developing techniques for reducing contamination releases, structural damage and toxic mold growth associated with flooding of buildings, and establishing emergency assistance centers in neighborhoods at risk from flooding;
 - i. advance regional sustainability, encourage infill development and job creation, provide diverse housing served by transit and protect historical and cultural resources;
 - j. encourage the remediation of shoreline areas with existing environmental degradation and contamination in order to reduce risks to the Bay's water quality in the event of flooding;
 - k. support research that provides information useful for planning and policy development on the impacts of climate change on the Bay, particularly those related to shoreline flooding;
 - l. identify actions to prepare and implement the strategy, including any needed changes in law; and
 - m. identify mechanisms to provide information, tools, and financial resources so local governments can integrate regional climate change adaptation planning into local community design processes.
7. To effectively address sea level rise and flooding, if more than one government agency has authority or jurisdiction over a particular issue or area, project reviews should be coordinated to resolve conflicting guidelines, standards or conditions.

Safety of Fill

2. Even if the Bay Plan indicates that a fill may be permissible, no fill or building should be constructed if hazards cannot be overcome adequately for the intended use in accordance with the criteria prescribed by the Engineering Criteria Review Board.
4. Adequate measures should be provided to prevent damage from sea level rise and storm activity that may occur on fill or near the shoreline over the expected life of a project. The Commission may approve fill that is needed to provide flood protection for existing projects and uses. New projects on fill or near the shoreline should either be set back from the edge of the shore so that the project will not be subject to dynamic wave energy, be built so the bottom floor level of structures will be above a 100-year flood elevation that takes future sea level rise into account for the expected life of the project, be specifically designed to tolerate periodic flooding, or employ other effective means of addressing the impacts of future sea level rise and storm activity. Rights-of-way for levees or other structures protecting inland areas from tidal flooding should be sufficiently wide on the upland side to allow for future levee widening to support additional levee height so that no fill for levee widening is placed in the Bay.

Shoreline Protection

1. New shoreline protection projects and the maintenance or reconstruction of existing projects and uses should be authorized if: (a) the project is necessary to provide flood or erosion protection for (i) existing development, use or infrastructure, or (ii) proposed development, use or infrastructure that is consistent with other Bay Plan policies; (b) the type of the protective structure is appropriate for the project site, the uses to be protected, and the erosion and flooding conditions at the site; (c) the project is properly engineered to provide erosion control and flood protection for the expected life of the project based on a 100-year flood event that takes future sea level rise into account; (d) the project is properly designed and constructed to prevent significant impediments to physical and visual public access; and (e) the protection is integrated with current or planned adjacent shoreline protection measures. Professionals knowledgeable of the Commission's concerns, such as civil engineers experienced in coastal processes, should participate in the design.
3. Authorized protective projects should be regularly maintained according to a long-term maintenance program to assure that the shoreline will be protected from tidal erosion and flooding and that the effects of the shoreline protection project on natural resources during the life of the project will be the minimum necessary.
4. Whenever feasible and appropriate, shoreline protection projects should include provisions for nonstructural methods such as marsh vegetation and integrate shoreline protection and Bay ecosystem enhancement, using adaptive management. Along shorelines that support marsh vegetation, or where marsh establishment has a reasonable chance of success, the Commission should require that the design of authorized protection projects include

provisions for establishing marsh and transitional upland vegetation as part of the protective structure, wherever feasible.

5. **Adverse impacts to natural resources and public access from new shoreline protection should be avoided.** Where significant impacts cannot be avoided, mitigation or alternative public access should be provided.

Recreation.

6. To enhance the appearance of shoreline areas, and to permit maximum public use of the shores and waters of the Bay, **flood control projects should be carefully designed and landscaped and, whenever possible, should provide for recreational uses of channels and banks.**

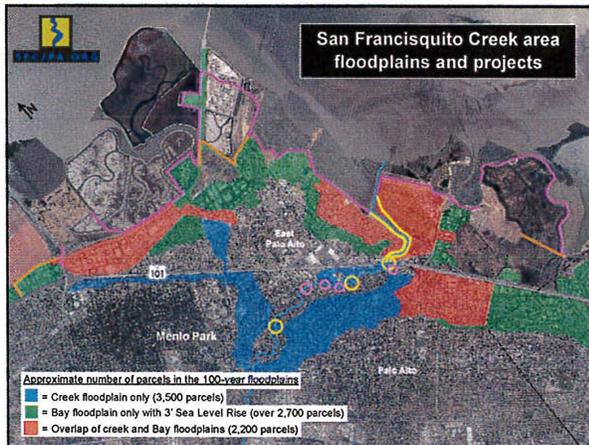
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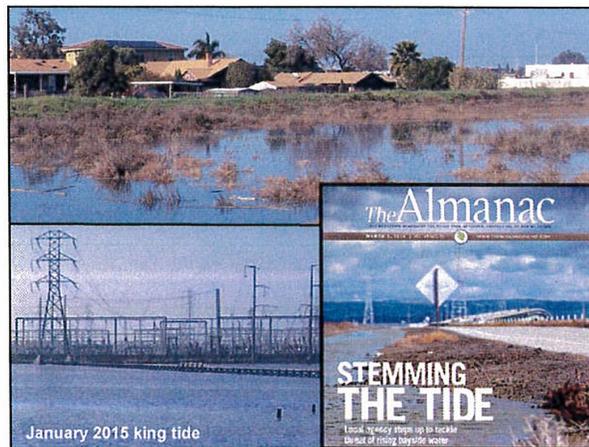
2. In addition to the public access to the Bay provided by waterfront parks, beaches, marinas, and fishing piers, **maximum feasible access to and along the waterfront and on any permitted fills should be provided in and through every new development in the Bay or on the shoreline, whether it be for housing, industry, port, airport, public facility, wildlife area, or other use, except in cases where public access would be clearly inconsistent with the project because of public safety considerations or significant use conflicts,** including unavoidable, significant adverse effects on Bay natural resources. In these cases, in lieu access at another location preferably near the project should be provided.
5. **Public access should be sited, designed, managed and maintained to avoid significant adverse impacts from sea level rise and shoreline flooding.**
6. **Whenever public access to the Bay is provided as a condition of development, on fill or on the shoreline, the access should be permanently guaranteed.** This should be done wherever appropriate by requiring dedication of fee title or easements at no cost to the public, in the same manner that streets, park sites, and school sites are dedicated to the public as part of the subdivision process in cities and counties. **Any public access provided as a condition of development should either be required to remain viable in the event of future sea level rise or flooding, or equivalent access consistent with the project should be provided nearby.**

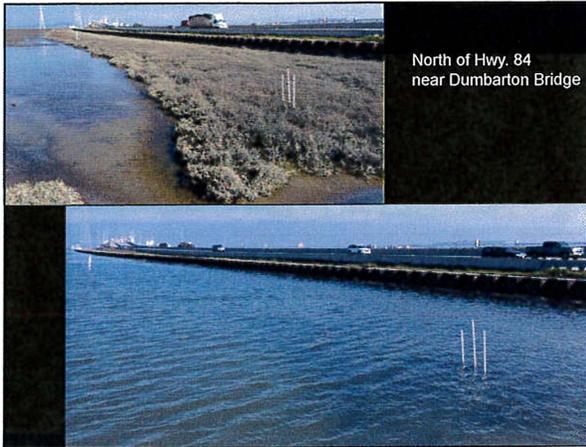
Other Uses of the Bay and Shoreline

1. **Shore areas not proposed to be reserved for a priority use should be used for any purpose (acceptable to the local government having jurisdiction) that uses the Bay as an asset and in no way affects the Bay adversely. This means any use that does not adversely affect enjoyment of the Bay and its shoreline by residents, employees, and visitors within the site area itself or within adjacent areas of the Bay or shoreline.**

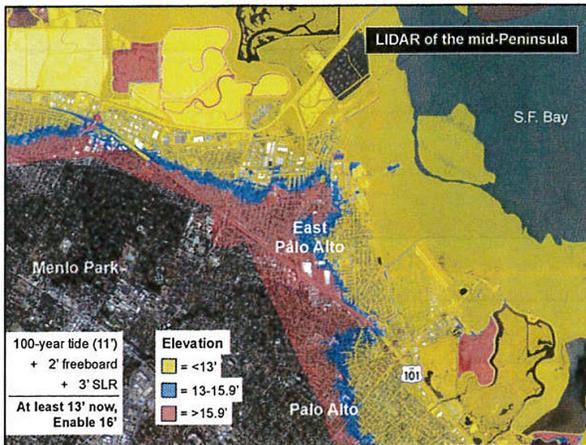














SAFER Bay Project
Protect 5,000 properties & major infrastructure, restore marshes, connect communities through trails

Two counties and three cities.
11 miles of shoreline with 11 reaches that include 24 options.
Each alternative includes all reaches and only one option per reach.

Construction may occur in two phases (1 FEMA floodplain, 2 SLR) and may be geographically or temporally separable.

SAFER Bay Project Objectives

- Reduce risk of coastal flooding and remove properties from FEMA 100-year floodplain (including freeboard) and 3 feet of Sea Level Rise.

Elevation ¹ or Height	Minimum design elevation (1% SWL only)	
	Existing Conditions	Considering 3 ft of SLR
1% SWL elevation (100-year tidal floodplain) ²	11.3 ft	14.0 ft
Required freeboard above the SWL	2.0 ft	2.0 ft
Minimum design elevation²	13.0 ft	16.0 ft

- Utilize marshes for flood protection in a way that restores and sustains marsh habitat in coordination regional efforts.
- Expand opportunities for recreation and community connectivity in coordination with regional and local efforts.
- Minimize future maintenance requirements.
- Create partnerships with entities whose assets could be protected.
- Ensure objectives can be met regardless of neighboring action/inaction.

SAFER Bay Project Constraints

- Cost
- Utility infrastructure
- Viewshed
- Tidal marsh wetlands
- Endangered species habitat
- Roads, trails & flight path
- Interior (stormwater) drainage
- Property within and adjacent to levee alignment
- Hazardous waste and landfill sites



SAFER Bay Project | 2016 | SFCJPA

Available at sfcjpa.org

Public Draft Feasibility Report

SAFER Bay Project

Strategy to Advance
Flood protection, Ecosystems and
Recreation along San Francisco Bay

East Palo Alto and Menlo Park
(Task Order 1)

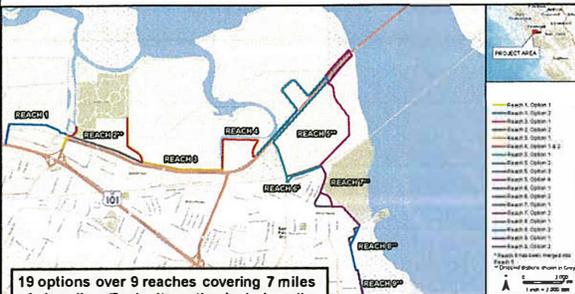
October 2016



SFCJPA.ORG

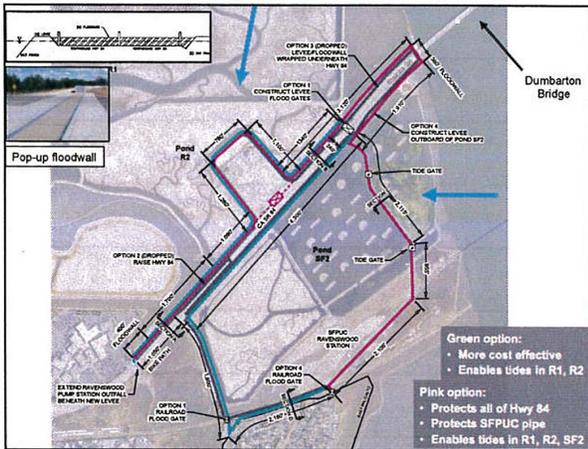
San Francisco Creek
Joint Powers Authority
815 B Menlo Avenue
Menlo Park, CA 94025

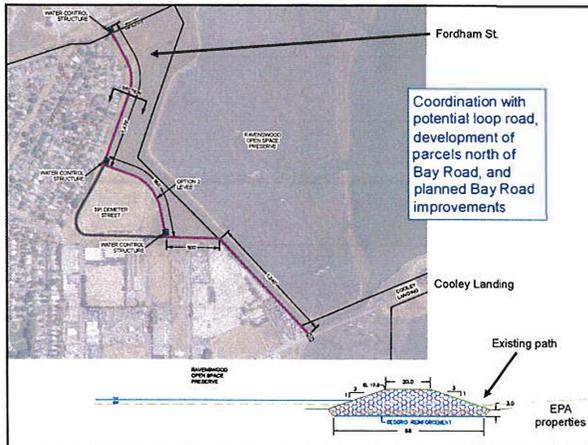
SAFER Bay Public Draft Feasibility Report for EPA & MP

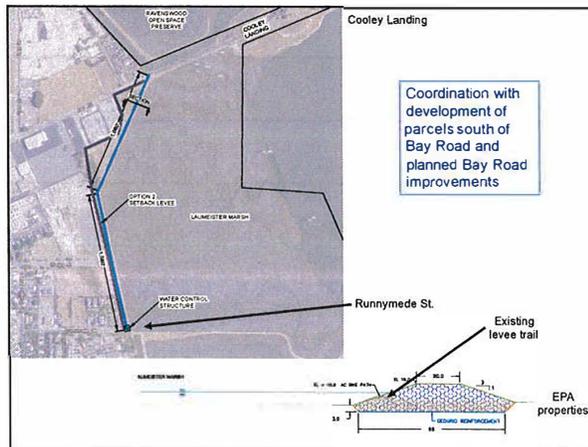


19 options over 9 reaches covering 7 miles of shoreline. Each alternative includes all reaches and only one option per reach.

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Agency and public input

- City Council meetings
- League of Women Voters public meetings
- Public EIR Scoping meetings
- Public Draft EIR meetings
- City staff review of administrative drafts
- Salt Pond Restoration Project Management Team
- Meetings with regulatory agencies
- BCDC working group

SAFER Bay's SMC-side funding approach

Diverse assets protected require diverse funding sources

Planning and design funding as of Dec. 2016 (\$2,000,000)

- State of CA (\$1.32M) – Dept. Water Resources, Coastal Conservancy
- Cities of East Palo Alto and Menlo Park
- U.S. Fish & Wildlife Service
- Facebook, Inc.

Construction funding (feasibility level est. \$90-116M) potential sources

- State of California, federal government
- S.F. Bay Restoration Authority
- Private sector
- Special tax or assessment district
- Community-wide aggregated flood insurance

