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FINANCE GUIDE
FOR
RESILIENT BY DESIGN
BAY AREA CHALLENGE DESIGN TEAMS
FINAL VERSION 2.0



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Delivered.

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SUMMARY FINDINGS & RECOMMENDATIONS

The initial draft of the Finance Guide (version 1.0) was prepared over a compressed time period in fall 2017 to give the Resilient by Design Bay Area Challenge design teams initial guidance on project finance in the California context. The Resilient by Design (“RbD”) finance advisory team has learned a great deal about the challenges of funding resilient infrastructure for rising Bay levels in the six months following the release of version 1.0. With the benefit of the final project designs and the associated roadmaps for finance and implementation for each design team (**see Appendix C**), we can now provide summary findings and recommendations as a prologue to an update Finance Guide, version 2.0.

INITIAL FINANCE STRATEGY

The biggest challenge our design teams faced is that unlike the Rebuild by Design effort that took place in New York, New Jersey and Connecticut, there is no dedicated source of follow-on funding available from the federal government. Without those pre-designated federal funds, RbD design teams must collaborate with stakeholders in the public, private and nonprofit sectors to generate the federal, state, and local funding needed to advance the most promising aspects of the projects put forward.

Furthermore, version 1.0 of the Guide noted the big difference between “pre-development” funding and long-term project finance. Our experience with design teams over the last six months has verified just how acute that difference is.

Below are recommendations to secure the pre-development funding essential to continue the work begun by RbD. This strategy applies whether a stakeholder is seeking funding for a specific project on the path to fulfilling a larger design concept (the “incremental” approach) or seeking funding to develop a design concept before embarking on specific project implementation (the “concept” approach). A concise graphic summary of the process of moving from “concept” to “implementation” for resilient projects is shown in **Appendix D**, a slide deck entitled “Building Resilience – 4 Ways to Find Resources for Protection and Prevention”, prepared by Shalini Vajjhala of re:focus partners.

Grant Funding is Crucial at this Stage of the RbD Work

None of the design teams came up with “biddable specs” for a specific project. That was not the goal of RbD. While some came up with detailed concepts for specific projects, all of these concepts need more planning, engineering, and entitlement work before construction can begin. The city and county governments that are among the stakeholders that can most benefit from RbD projects are not necessarily in a position to provide funding for pre-development costs. Other funding sources must be found.

See **Appendix E, Tables 1 through 3** for additional detail on these programs and the grant opportunities identified for the design teams. Distilling the key information out of the documentation for each grant program is extremely challenging. Grant criteria for some major potential funding sources, such as the recently passed state water bond on the June 2018 ballot, have yet to be established. As a result, the attached tables contain some significant data gaps.

Grant Funding is for High-Risk Investments

Pre-development costs in the private sector are considered the riskiest investments for a land developer. These costs can easily amount to five percent of the total project cost. For major projects, millions need to be invested with no assurance that the project will ever come out of the ground. Consequently, pre-development costs are typically funded by developer equity, as opposed to debt.

The same is true in the public sector. Elected officials generally do not want to tax their voters to pay for speculative pre-development costs for major infrastructure projects. Grants are the preferred funding source for pre-development costs in the public sector. At this point, nearly every project or concept put forth by the

RbD design teams will be viewed as a high risk investment by elected officials. Again, grant funding is the necessary next step for the RbD design teams.

Getting “Entrained” for Grants

Getting entrained means qualifying as an eligible project for funding under a particular grant program and then winning that first grant. After that, it is significantly easier to win additional funding from the same program. Consequently, design teams and their stakeholder advocates need to focus on the “entrainment” process to maximize their chances of getting additional grant funding.

The RbD Finance Team believes that most immediately available grant funding sources for the RbD design team projects and concepts are from the State of California combined with regional funding from Measure AA and the recently adopted Regional Measure 3. Federal programs, discussed in the next section, potentially offer more total funding but the application process is more challenging, and very competitive since the applicant pool is larger.

Public grant programs typically have an annual cycle for grant applications and specific information requirements for applications. Consequently, to become entrained, the RbD design teams not only need to get on the annual grant application cycle for each grant source, but also develop the specific information on their project required for the application. This is particularly true for the Army Corps of Engineers Continuing Authorities Program.

It takes Money to Get Entrained

It takes money to get money. For an RbD design team to become entrained for grant funding, an investment is required to prepare the application. At present, there is no committed source for this interim funding needed to prepare grant applications. The most immediate challenge facing the RbD design teams – and the jurisdictions moving forward with the project - is where to get the money to do the necessary work to prepare grant applications.

Role of “Asset Defenders”

The RbD process revealed that there are many public and private assets of great value that are likely to be inundated by rising Bay levels. The owners of those assets are a prime source of the interim funding that will enable the design teams, or local jurisdictions, to become entrained for grant funding. This is the one category of stakeholder that the RbD Finance Team views as the most ready source of interim grant funding. Among these asset defender stakeholders that we see as key candidates for providing interim funding are public utilities with exposed facilities, MTC (for transportation facilities), and major Silicon Valley firms with exposed facilities.

Next steps

Each design team and jurisdiction applying for the grant needs to do the following:

- Link each component of their project and/or concept to specific State and local grant funding sources
- Link each component of their project and/or concept to an “asset defender” that might provide interim funding to prepare grant applications.
- Continue to focus on multiple benefits beyond traditional flood protection to tap existing funding streams for wetland restoration, environmental mitigation, affordable housing, transportation improvements, etc.
- Devote resources to monitoring grant opportunities and engaging professional grant writers with specific expertise California grants for resiliency planning and implementation.
- Get local leaders and their staffs to communicate their funding needs directly to state elected officials and state agency program managers.

Other Take-aways.

While there is detailed discussion in the main body of this Finance Guide for potential funding sources, both short-term and long-term, we want to offer some key insights on these funding sources and related issues that we learned during the RbD process.

Federal Grant Funding

Long application process, lengthy environmental review process, and high overhead costs combine to make using federal funding for small projects inefficient. Taking advantage of economies of scale associated with grant applications for larger projects is critical for getting funding from federal agencies such as the U.S. Army Corps of Engineers and the Federal Emergency Management Agency. With this background we recommend three strategies for RbD projects:

- **“All the marbles in one bag”:** Aggregate similar design elements across sites into one project. One example are the flood control pump upgrades identified in the *Elevate San Rafael* project. These are ideal candidates for HMGP funds. Such projects are well suited for HMGP funds because they can be designed, pass environmental review, and be completed within the program’s two-year time frame. For flood control projects, coordination with the Bay Area Flood Protection Agencies Association (BAFPAA) members could build support for a unified Notice of Interest package to the Corps.
- **“Bigger is better”:** In a recent federal appropriations bill, Congress allocated \$35 million to central valley flood protection. This appropriation comes as a result of a unified focused effort by elected officials and state agencies to inform and engage key representatives. Bay Area local agencies need a similar regional approach to access federal funds. See comments, below, under *Governance* about this approach.
- **“Hitch your wagon to a bigger horse”:** Around the Bay there are large projects that are underway such as flood control projects described in the [South Bay Sponge](#) design report for the South Bay. RbD stakeholders should work with these project managers to see if they can be expanded to incorporate RbD concepts, including serving as mitigation for other development projects around the Bay. [The Grand Bayway](#) report project is a perfect example of this mitigation strategy.

Private Philanthropy

Private philanthropy was critical to the success of RbD. RbD was attractive because it had a clearly articulated objective and timeline and the potential to generate interest in the public and private sectors to continue the work. The recent \$1 million commitment by Pacific Gas & Electric to replicate community resiliency planning around the state similar to RbD indicates success in this regard.

With the conclusion of RbD, the next strategy for attracting private philanthropic should focus on targeted, site-specific efforts such as engaging disadvantaged communities in resiliency planning. This approach could apply to many of the projects given the communities they engaged, with the [The People’s Plan](#) for Marin City a key example.

STATE INITIATIVES

The Finance Team has identified several state initiatives that would address several of the challenges discussed above:

Continue Working to Expand Funding Options for Storm Water Utilities

Storm water utilities are constrained by California Constitution Article XIIIID, added by Proposition 218 in 1996, that makes raising revenue from user fees more difficult than for water and sewer utilities. Recent state legislation (SB 231 in 2017) corrected this imbalance, but the effect will probably be determined by the courts

based on the outcome of a future legal challenge. This issue could be considered one of the most important funding issues for resiliency in the Bay Area and should be tracked closely.

Enable Geological Hazard Abatement Districts to Levy Special Taxes

Geological Hazard Abatement Districts (GHADs) offer a unique governance option for adaptation projects. GHADs can include non-contiguous territory across jurisdictional boundaries and can be governed by either an existing local agency or new elected board. At the same time, GHADs remain a single-purpose public entity focused on geological hazards that can include shoreline protection from sea level rise.

One limitation of GHADs is that they can only levy property tax assessments based on the “special benefit” requirements of the California Constitution Article XIID (Proposition 218). Expanding the power of a GHAD to impose special taxes through an election, such as allowed under a Community Facilities District, would add flexibility to design a finance plan that is sensitive not only to benefits, but also to the ability to pay among property owners.

Broaden Grant Criteria to Promote Multi-Benefit Projects

As discussed above, project proponents will need to tap existing sources of grant funding few of which are specifically designed for adaptation planning or projects. Also, as discussed above, one of the most likely sources of near-term funding is from agencies responsible for managing significant public assets along the Bay shoreline threatened by sea level rise.

A clear opportunity in this regard is to broaden the criteria for transportation projects eligible for funding through the Regional Transportation Plan that is part of Plan Bay Area. All nine project sites address the resilience of at least one major transportation asset (highway or rail transit) and some include two in their designs (see Appendix F, **Table 7**).

GOVERNANCE

Addressing funding needs for RbD projects cannot ignore the challenge associated with governance. The region would be much more effective competing for regional, state, and federal funding if the multiple local jurisdictions around the Bay worked from a coordinated plan that integrated adaptation projects sponsored by local jurisdictions into a coherent regional solution.¹

We appreciate that bringing more coherent governance to adaptation planning in the Bay Area will need to address a range of concerns related to regional planning, local control, and funding. Progress is likely to occur incrementally. However, as public finance practitioners we see a strong analogy to existing regional planning and funding practices for transportation.

The Bay’s transportation system has long been subject to regional planning mandated by federal and state legislation and tied to federal and state transportation funding. The Metropolitan Transportation Commission (MTC), now merged with the Association of Bay Area Governments (ABAG), develops the region’s Regional Transportation Plan (RTP) and Sustainable Communities Strategy (SCS). These plans support funding for transportation projects sponsored by local jurisdictions. In addition, eight of the nine Bay Area counties have their own transportation planning agencies supported by sales tax measures, often referred to as “self-help” counties. These county efforts provide funding to supplement RTP revenues and target local needs. Together the funding from these regional and county agencies act like a “carrot” that encourages local jurisdictions to integrate their transportation projects into a coherent regional plan.

¹ Dr. Mark Lubell, *The Governance Gap: Climate Adaption and Sea Level Rise in the Bay Area*, University of California at Davis, 2017.

Bay Area adaptation planning could follow a similar structure. The region already has a nascent regional climate adaptation planning effort through the Bay Area Regional Collaborative (BARC) that coordinates efforts by MTC/ABAG, the Bay Area Air Quality Management District (BAAQMD), and the Bay Conservation and Development Commission (BCDC)². The region also has a nascent adaptation funding source in the form of the San Francisco Bay Area Restoration Authority. The region should build on these efforts by:

- Integrating regional adaptation planning into the RTP/SCS and other regional plans (a current goal of BARC)
- Providing local jurisdictions with policy guidance on how adaptation projects can link coherently into a regional strategy (not a simple task, we understand).
- Using MTC/ABAG to coordinate and aggregate funding needs for more competitive regional, state, and federal grant applications.

OTHER FUNDING CHALLENGES

After reviewing all the final design reports, we were impressed with two other significant funding challenges:

- **Disadvantaged communities** are highlighted in all the projects. In many areas these communities will bear the primary costs of rising bay levels. These communities will not have the financial resources to provide local funding, and a local funding strategy based on redevelopment and rising property values could cause displacement. Several projects highlighted the use of community land trusts to stabilize property values and maintain affordability. Land trusts will need funding for implementation. The region will need to address this issue and consider how to integrate equity into funding decisions.
- Some form of **managed retreat** is also discussed in many of the projects where the Bay is allowed to expand onto currently developed lands. The Design Teams offered creative solutions such as transferring development rights from inundated lands while increasing densities on other lands (examples: [Islais Hyper-Creek](#) and [South Bay Sponge](#)). Though the region may not experience the immediacy of this issue for several decades, evaluating feasibility and providing guidance through local land use plans would assist local property owners and the real estate market to clearly assess the costs of defense versus retreat.

² BCDC has also conducted regional adaptation planning through its Adaptation to Rising Tides (ART) program.

CHAPTER 1: INTRODUCTION

BACKGROUND AND PURPOSE

The purpose of this guide is to assist design teams that are part of the Resilient by Design Bay Area Challenge (RbD) by providing a funding and financing reference guide for resilient infrastructure along the San Francisco Bay shoreline.³ The specific scope and scale of each team's project design is not known at this time. Thus, the Guide provides a strategic perspective and descriptive overview of funding and financing options to help orient design ideas towards more feasible, fundable projects.

The Guide describes the broad range of traditional funding sources and financing mechanisms used for infrastructure development in California, with a focus on the State's unique constraints and approval requirements. The guide focuses on the need for support from local voters and landowners as a prerequisite for implementation of a Bay Area-wide resilient infrastructure program. Finally, the guide includes several alternative revenue sources that have not been used, or rarely used, to fund infrastructure in California.

During the design phase from December through May, the finance advisory team will provide specific project-level guidance as requested by each design team. We will also provide a review of each team's project finance plan.

The Guide focuses on funding sources more than financing mechanisms because the latter is irrelevant without the former. For resilient infrastructure, too much emphasis has been placed on developing innovative financing mechanisms without regard to how to create new revenue sources to pay back debt holders or equity investors. Thus, the guide does not focus on borrowing or investment mechanisms and vehicles, such as:

- Bond classifications (green, resilient, social impact)
- Subsidized lending pools (green banks, infrastructure banks, revolving loan funds)
- Private equity structures (public-private partnerships)
- Risk-based financing such as catastrophe bonds and resilience bonds.

Alternative financing mechanisms may play a role in project finance for RbD projects, but they can be a distraction at the predevelopment stage rather than a serious pathway to attracting resources. However, we will bring our expertise with alternative financing to the design phase should it be applicable to a particular team's design.

PREDEVELOPMENT FUNDING

The Guide makes a crucial distinction between short term funding sources for predevelopment costs versus longer term sources for construction financing. Predevelopment costs typically are funded entirely from one-time funding sources, such as grants. Long term project finance requires the creation of new long-term revenue sources, as well as one-time sources such as grants.

The RbD focus on implementable project designs poses challenges for a project finance plan. The innovation likely to be exhibited by RbD teams and their projects should stimulate the San Francisco Bay region to continuing moving forward plans for adaptation and resilience. But to build on this enthusiasm after RbD ends in May 2018, projects will need additional predevelopment funding to continue the design process and move towards "shovel ready" projects. Financing is unlikely to be available for early-stage predevelopment costs because of the lack of a secure revenue stream for lenders or investors. Hence a key focus of the guide is on

³ Infrastructure to improve the resilience of the San Francisco Bay shoreline to sea level rise, severe storms, flooding, and earthquakes.

government grants and other public and philanthropic funding to continue the design process after RbD ends. Furthermore, design teams should make every effort to identify a local public agency sponsor for their project because eligible recipients for most government grants are other government agencies or tribes. In a few cases nonprofit organizations are eligible as well.

FUNDING FOR PROJECT IMPLEMENTATION

Larger, more ambitious RbD projects will require significant funding to be implemented at scale along the Bay shoreline. Indeed, resilient infrastructure to meet the ongoing, long term challenge of sea levels rise is likely to require a significant level of investment regionwide with a planning horizon measured in decades. Thus, finance plans for larger RbD projects may have longer planning horizons based on an extended process of community engagement needed to support approval of new local, regional, and state funding sources. For these larger projects, we are prepared to advise teams on reasonably anticipated (to be approved) regionwide public revenue streams.

HOW TO USE THIS GUIDE

The guide is not designed to be read from front to back, but rather as a tool kit with sections accessed based on a team's knowledge of infrastructure finance. See the table below for an overview of the Guide by chapter. Note that the applicability of individual funding sources for either predevelopment costs, project finance, or both, is discussed for each potential funding source.

Key terms:

“Funding” = “revenue”
“Financing” is the use of revenue to repay debt or equity.
“Finance” or “Project Finance” refers to the entire process of funding and financing

Section	Content
Chapter 1: Introduction	Background, purpose, major themes
Chapter 2: Challenges & Strategies	Challenges and strategies related to funding resilient infrastructure
Chapter 3: Local & Regional Public Sources	Description of local and regional public revenue sources, related financing mechanisms, and a selection guide
Chapter 4: State & Local Grants	Description of state and local grant programs
Chapter 5: Federal Grants	Description of federal grant programs
Chapter 6: Alternative Sources	Description of several alternative funding sources

CHAPTER 2: RESILIENT INFRASTRUCTURE FINANCE CHALLENGES AND STRATEGIES

This chapter provides a summary of the challenges faced by resilient infrastructure finance and strategies to address them.

CHALLENGES

Resilient Infrastructure Finance

Finding the resources for any large infrastructure project is challenging, much less a resilient infrastructure system surrounding the entire Bay. Historically, major infrastructure projects, ranging from coastal protection projects to large economic redevelopment plans, were revenue producing or exclusively publicly funded. As public funds have grown scarcer, so have project implementation options. Securing funding for resilience projects is even more difficult. Below are some key characteristics that distinguish project finance for resilient infrastructure from traditional infrastructure.

- **Systems not projects:** Most resilience projects are large collections of interventions, such as green storm water infrastructure systems, rather than individual assets, like a water treatment plant. As a result, these projects can take longer to design, pose unique technical challenges, and have higher predevelopment costs.
- **Diffuse benefits:** A successful resilience solution will often generate benefits across broad areas and populations, such as improvements to ecosystem services and public health. However, diffuse benefits can be difficult to monetize relative to conventional single-function projects, such as a wastewater treatment plant or toll road. The key funding take-away here is that diffuse benefits mean potential access to multiple revenue sources.
- **Immediate success is something that doesn't happen:** Traditional infrastructure projects like roadways address immediate problems such as traffic congestion. In contrast, the benefits of most resilience projects are avoided costs or reduced losses that can be hard to capture and convert into revenues.

Resilient infrastructure systems have one major advantage over traditional projects: they can attract multiple “colors of money”.

Despite these challenges, well-designed resilient infrastructure systems have one major advantage over traditional projects: they can more easily attract multiple “colors of money”. Because resilience projects generally generate multiple cross-sector benefits, they also can access multiple funding sources, such as transportation and water grants.

Cobbling multiple funding streams together can take significant effort to strategically align different funding requirements and application cycles. However, it is well worth the effort. It can make the difference between large-scale investment that effectively mitigate risks to a vulnerable community, and incremental quick fixes that don't address long term challenges.

California Infrastructure Finance

Three challenges face the financing of infrastructure in California, and resilient infrastructure specifically.

First, federal funding for resilient infrastructure in California in advance of a disaster is unlikely in any significant amount. The federal budget faces much higher demands for adaption to sea level rise from communities outside the West coast. A 2017 peer-reviewed [scientific study](#) by the Union of Concerned Scientists projected levels of effective inundation along U.S. coasts up to the year 2100. Results of the study indicate that only one to two percent of all U.S. coastal communities projected to be effectively inundated by sea level rise are located along

the West coast. The remainder are along the Gulf, Florida, and East coasts due to greater levels of development and a shallower continental shelf.

Second, all RbD projects are likely to require new long-term public-sector revenue sources to secure project financing. The general funds of California’s non-enterprise local government entities⁴ are facing severe financial pressure because of unfunded pension liabilities. The California Public Employees Retirement System (“CalPERS”) has put in place a financial plan to amortize much of this unfunded liability over the next several years through a dramatic increase in payroll contribution rates. Local public agencies will be under more fiscal stress and will need to avoid major new funding commitments. While small amounts of predevelopment project funding may be an option, long-term infrastructure project financing is not possible without the creation of new long-term revenue sources.

Communities outside the West coast will place far more demands on federal funds for coastal resiliency.

Third, with reliance on local and regional funding sources comes reliance on community engagement. Under California law most new funding sources require a vote of the electorate or property owners. Funding dedicated to specific uses, such as a resilient infrastructure program, nearly always requires approval by two thirds. Thus, community engagement is a requirement to create a new public-sector revenue source in California.

Most new funding sources require a 2/3 vote and therefore significant community engagement.

Bay Area Infrastructure Finance

The Bay Area’s most recent regional plan makes it clear that local and regional funding is critical for infrastructure development in the region. Local and regional sources comprise two-thirds of forecasted revenues over the plan’s 24-year horizon for transportation infrastructure.⁵ This proportion is probably higher for other (non-transportation) resilient infrastructure given steep declines in state and federal infrastructure funding since the 1970s.

“What distinguishes the Bay Area from many other regions is the significant share of local and regional funding...” (*Plan Bay Area 2040*)

Only very preliminary work on the cost of protecting the Bay from a 4 foot or more sea level rise has been done – and the cost may be as high as \$35 billion. However, it is helpful to remember that the Bay Area has tackled such challenges before.

The initial three-county, voter-approved Bay Area Rapid Transit System (BART) in 1962 was projected to cost \$996 million, or \$7.1 billion inflated to 2016.⁶ Funding came from a combination of property taxes, bridge tolls, and fare revenues. This funding was used to support

general obligation and revenue bond financing for initial construction of the system. Since 1996, the Bay Area Toll Authority has been implementing a \$9.4 billion retrofit of the area’s major bridges funded largely by bridge tolls.

Locally funded multi-billion-dollar infrastructure investments are not new to the Bay Area.

Consequently, the Bay Area’s effort to fund resilient infrastructure needs to be a home-grown “bootstrap” effort.

⁴ Non-enterprise local government entities are general purpose agencies such as cities, counties, and community services districts with authority to impose general taxes. Enterprise operations such as sewer and wastewater utilities, and seaports and airports, are largely supported by fees, rates, and charges generated by the services they provide.

⁵ Metropolitan Trans. Commission/Association of Bay Area Governments, *Plan Bay Area 2040*, July 26, 2017, p. 37.

⁶ For costs, see [this summary](#) of BART’s history. For inflation index, see the [ABAG compilation](#) of the Consumer Price Index for the Bay Area. Inflation is from 1970 which adjusts for cost estimates that are assumed to have been in “year of expenditure” (nominal) dollars through the initial system construction period of the 1960s.

FUNDING STRATEGIES FOR BAY AREA RESILIENT INFRASTRUCTURE

The strategies described below set the stage for the specific funding options and decision guides presented in the chapters that follow.

Integrate System Design, Predevelopment Funding, and Project Finance

“The premise of RE.invest was that design and financing are fundamentally parallel and complementary activities.”

RE.invest, A Roadmap for Resilience, by re:focus partners provides an innovative strategy to link project design with project finance. Fundamental to the approach is a recognition that “resilience is about systems, not just projects.” As mentioned in *Resilient Infrastructure Finance*, above, resilient systems are often not made of a few large projects, but a number of smaller ones that fit together to reduce risks and expand benefits. From a funding perspective, a systems approach can create a wider range of funding options by monetizing benefits generated for multiple parties.

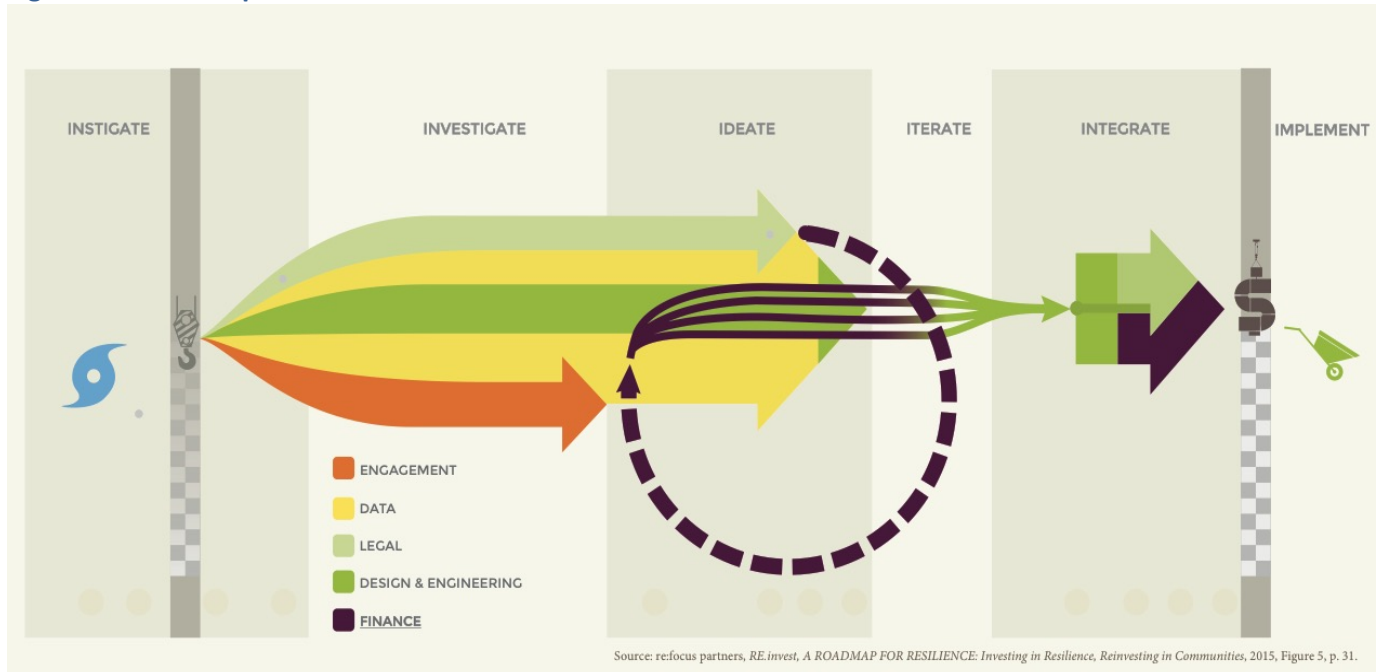
To this end, we recommend that design teams use every opportunity to integrate both predevelopment cost funding and project finance early in the design process. By predevelopment costs we mean the feasibility, design and entitlement work necessary to make a project “shovel ready.” Predevelopment costs in many respects are the highest risk investments in a potential project. The funding is needed before it is really known whether a project is feasible, or has entitlements.

Link cross-sector elements, such as transportation, energy, and/or water system solutions into project design.

As shown in figure below, RE.invest incorporates developing a finance plan as part of an expanded, integrated predevelopment process. This does not mean design teams need a detailed project finance plan identifying debt and/or equity financing mechanisms. Instead, teams should look for ways to link cross-sector elements, such as transportation, energy, and/or water system solutions into project design. This strategy will enable project sponsors to identify their project’s eligibility for a wide range of funding sources.

Examples of this approach include integrating broadband or fiber networks into water system upgrades, running utilities through new sea water berms, or finding ways to create new energy or water efficiencies. These approaches bring conventional revenue-generating infrastructure into a larger portfolio of resilience solutions to help fund project implementation.

Figure 1: Predevelopment Process



Identify Communities of Benefit

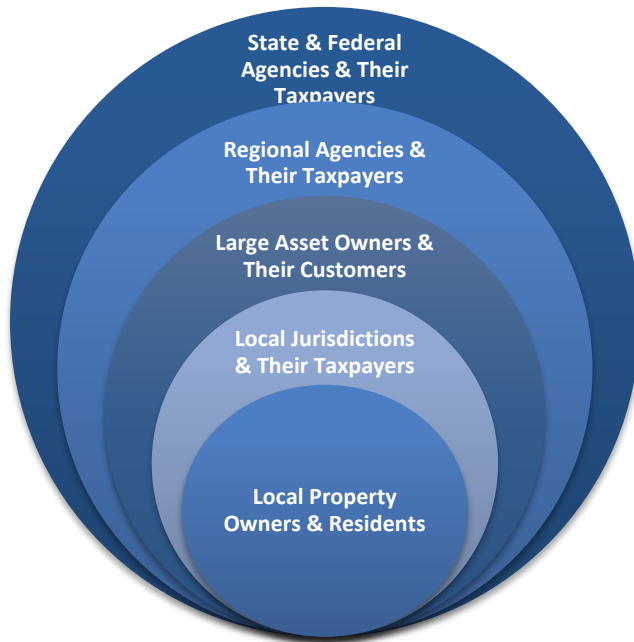
Most major infrastructure projects rely on multiple streams of funding, so identifying as many communities that benefit from the project as possible is critical. Starts with closer in communities most directly affected by the project. Identify opportunities for revenue-generating assets. Then move out and up to communities that may receive less direct but nonetheless identifiable benefits.

The following six categories summarize potential funding communities for design teams to investigate as they consider design alternatives:

Community #1: Local property owners and residents receive the most direct benefits from coastal resiliency projects by reducing losses from inundation caused by floods, tides, and storm surge. The challenge is that planning horizons for local property owners and residents can be short (less than 10 years) and therefore local property owners and residents have limited willingness to pay for long-term risk reduction.

Community #2: Local jurisdictions and their taxpayers receive direct benefits associated with the tax base protected and associated with community #1. If the project reduces risks across a large enough area of the jurisdiction, and/or protects major employment centers, benefits may extend jurisdiction-wide. All residents and businesses may collectively perceive the importance of protecting essential areas of the community. Also, local jurisdictions may play a role in addressing equity concerns if vulnerable communities are part of community #1.

Figure 2: Communities of Benefit



Community #3: Large Asset Owners and their customers, such as wastewater treatment utilities, transportation agencies, and investor-owned utilities, receive similar risk reduction benefits as local private property owners. However, these benefits extend to the entire service territory of the asset. Service territories are often large multi-city areas that would represent a larger funding potential relative to communities #1 and #2. Critical transportation arteries often provide economic benefits across the entire region.

Community #4: Regional agencies and their taxpayers receive less direct but nonetheless real benefits compared to the other communities. Benefits could overlap with community #3 if the critical asset plays a significant role in supporting the region's economy. Regional taxpayers may also play a role in funding the protection of vulnerable communities and the provision of ecosystem benefits.

Community #5: State and federal agencies and their taxpayers are an extension of regional agencies, receiving less direct benefits but still benefiting from reducing economic losses in one of the nation's most economically productive metropolitan areas. This community may overlap with community #3 if the state or federal government owns critical assets protected by the project. Like community #5, state and federal agencies may also play a role in funding the protection of vulnerable communities and the provision of ecosystem benefits.

The [Oro Loma Experimental \[Horizontal\] Levee](#) project is an example of a project with multiple communities of benefit. The project is designed to provide water quality, flood control, and habitat restoration. If successful and implemented on a large scale, this systemic approach to resilient infrastructure could provide benefits along the East Bay shoreline from San Leandro to Union City. See [this report](#) for more details on the challenges and multiple potential benefits associated with this effort.

CHAPTER 3: LOCAL & REGIONAL PUBLIC REVENUE SOURCES

This section describes potential revenue sources from the public sector that are suitable for project financing for resilient infrastructure in the State of California.

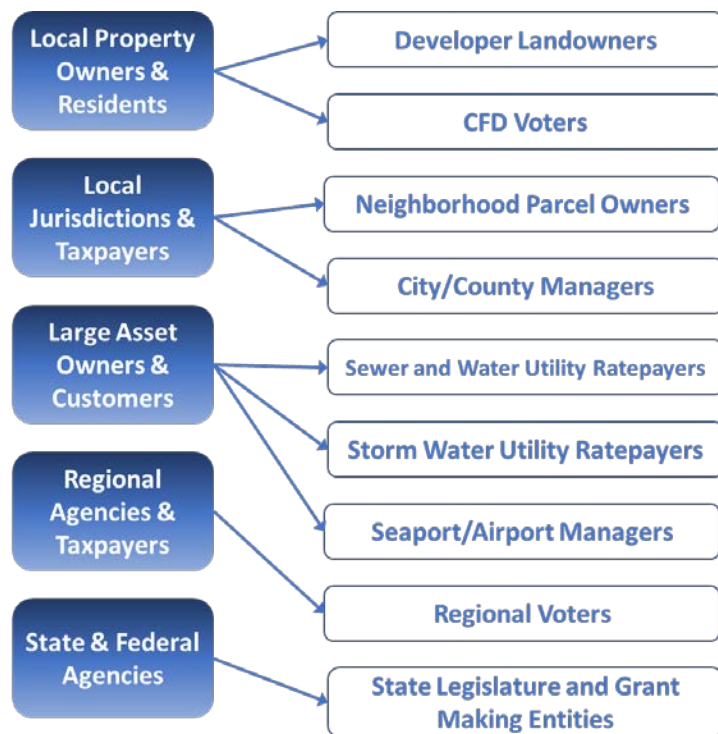
Creating new revenues sources in California - Put simply, no public entity in California can create a new revenue source solely by action of its elected board.⁷ All new revenue sources require some level of consent from the entities paying the new revenue source. **Consequently, design teams need to keep in mind that some form of community engagement is likely to be legally required for long term project financing from the public sector.** The legal requirements for the consent required for a new revenue sources vary widely, depending on the type of revenue source, the type of project to be funded, and the type of public entity sponsoring the project.

In many cases new local revenue sources will not be needed to fund predevelopment costs, at least smaller amounts associated with initial predevelopment efforts prior to final permitting, design, and engineering.

INTRODUCTION

The figure below breaks out the communities of benefit discussed in the last chapter into individual stakeholders that have the authority to approve revenue sources for funding or financing resilient infrastructure. Regardless of the type of financing, the creation of any new revenue source must follow the same legal process. Accordingly, this guide does not focus on types of financing as much as types of underlying revenue sources.

Figure 3: Communities of Benefit – Revenue Approving Stakeholders



With respect to resilient infrastructure, it is important to identify the different public entities and other interest groups that have the legal authority to authorize a new revenue source. To understand how revenue sources link to resilient infrastructure, it is best to start with establishing the links between the potential revenue entities and potential benefits, as opposed to the actual types of resilient infrastructure. Each public entity or revenue metric interest group is focused on particular types of benefits. The first table on the following page below shows the links between different stakeholders and the types of benefits that are most likely to compel them to create a new revenue stream.

Given this linking of potential benefits and revenue groups, the second table on the following page shows the potential connections between different types of projects and different public entities and other revenue stakeholders.

Note that these links are not legal, but rather the historic links based on actual experience in community engagement with each set of stakeholders.

⁷ The key exception for infrastructure funding are impact fee programs and large asset owners not subject to Proposition 218, such as electric utilities.

The public entities and stakeholders listed along the horizontal axis of the matrix are all the entities that can legally raise revenue related to resilient infrastructure. It is important to note that these links are valid whether the public agency is a small city or a regional government. The State's Constitutional limitations on taxation and debt apply to all.

Figure 4: Linking Benefits to Project Sponsors

Linking Benefits to Project Sponsors									
Potential Benefits to Revenue Sponsoring Entity	Developer Landowners	Neighborhood Community Parcel Owners	Sewer and Water Rate Payers	Storm Drain Utility Ratepayers	Seaport & Airport Managers	City and/or County Managers	Registered Voters within a CFD	Registered voters within a Region	State Legislature
Directly benefit utility				✓	✓				
Avoid existing flooding	✓	✓		✓	✓	✓	✓	✓	✓
Avoid future flooding				✓	✓				✓
Enable new development	✓					✓			
Lowens existing operating costs			✓	✓	✓	✓			
Reduce traffic		✓				✓	✓	✓	✓
Produce more affordable housing	✓	✓				✓		✓	✓

Figure 5: Linking Projects to Revenue Approving Stakeholders

Linking Projects to Revenue Approving Stakeholders									
Project Type	Developer Landowners	Neighborhood Community Parcel Owners	Sewer and Water Rate Payers	Storm Drain Utility Ratepayers	Seaport & Airport Managers	City and/or County Managers	Registered Voters within a CFD	Registered Voters within a Region	State Legislature
Horizontal levy	✓	✓	✓	✓	✓	✓	✓	✓	
Seawall to protect specific area	✓	✓	✓*	✓	✓	✓	✓		
Upstream flood control		✓		✓		✓	✓	✓	
Highway flood control protection		✓		✓		✓	✓	✓	✓
Neighborhood flood control protection	✓	✓		✓		✓	✓		
Offsite habitat loss mitigation	✓				✓				

* (e. g. wastewater treatment plant)

DESCRIPTION AND EVALUATION OF POTENTIAL REVENUE SOURCES

This section provides a description of the range of traditional local and regional public revenue sources used to fund infrastructure in the Bay Area. Each source is evaluated based on its specific applicability to resilient infrastructure. Revenue sources are grouped under three broad categories:

- **Financing districts and impact fees:** funding sources that can be created by local jurisdictions within defined geographic subareas, are dependent on land values, and are often associated with new development or redevelopment

- **Public and private enterprises:** utility and transportation enterprises that deliver a specific service and are funded by rates, fees, and charges (as opposed to taxes)
- **Cities, counties, and special districts:** local jurisdictions with taxing authority that could have either broad (cities and counties) or narrow (special districts) public service mandates.

The table below summarizes each type of revenue source against four key characteristics: applicability to resilient infrastructure, ability to secure debt financing, revenue potential, and community engagement required for authorization. Following the table is a detailed description and evaluation of each revenue source.

Figure 6: Local & Regional Public Revenue Sources

Revenue Source	Applicability to Resilient Infrastructure Systems	Security for Debt Financing	Revenue Potential	Community Engagement Required for Authorization
	Financing Districts & Impact Fees			
Special Assessments	NARROW: Must provide direct benefit to assessed parcels	Yes	LIMITED: But critical to capture direct benefits of RI	MODERATE: Majority district landowner approval weighted by assessment
Special Tax (landowner)	MODEST: Wide range of facilities & services; but implicit benefit to assessed parcels			MODERATE: 2/3 district landowner or voter approval
Development Impact Fees	MODEST: Wide range of facilities; but must benefit new development	No		LIMITED: Majority board approval
Property Tax Increment	BROAD: Wide range of facilities & services, environmental mitigation, private redevelopment	Yes	NONE in the short run; MODERATE in the long run	LIMITED: Majority board approval MODERATE: 55% district voter approval to issue debt
	Public & Private Enterprises			
Water, Sewer & Storm Water Rates & Charges	NARROW: Must support enterprise operations	Yes	MODERATE: To extent RI provides direct benefit to enterprise	LIMITED: Notice & protest hearing for rate increase; majority board approval to issue debt
Seaport or Airport Revenues				LIMITED: Majority board approval
Other Utilities & Railroads				LIMITED: Majority board approval; could involve CA Public Utilities Commission
Highway & Bridge Tolls	NARROW: Transportation Facilities & Services		MODERATE: To extent RI includes transportation	EXTENSIVE: Bridges: majority voter approval; expenditure plan Highways: state legislation
	Cities, Counties & Special Districts			
Special Taxes (jurisdiction)	BROAD: Any use approved by tax measure	Yes	SIGNIFICANT: Depending on size of tax base	EXTENSIVE: 2/3 voter approval by jurisdiction; expenditure plan
Ad Valorem Property Tax	BROAD: But fixed public improvements only			
General Tax	BROAD: Any government purpose	No (1)		EXTENSIVE: Majority voter approval
Gas Tax	NARROW: Transportation Facilities & Services	Yes	MODERATE: Tax base constrained	EXTENSIVE: 2/3 voter approval by county; expenditure plan
Note: "RI" is "resilient infrastructure".				
(1) Can use installment sale or lease agreement to fund facilities over multiple years, similar to debt financing.				

Financing Districts & Impact Fees

A key distinguishing characteristic of financing districts is that their boundaries can be adjusted to create a strong nexus between those providing the revenue and those receiving the benefits of funded facilities and services. Approval typically requires the consent of landowners or registered voters within the district.

Revenue potential and debt financing is associated with land values and typically constrained by bonding requirements. Revenue is typically limited to an amount such that the total combined level of property taxes and assessments does not exceed two percent of assessed value (AV) for any individual parcel. Given that existing property taxes and assessments often exceed one percent of AV, any new special assessment or tax is typically limited to one-half percent or less of AV. Total outstanding debt secured by special district funding is typically constrained to one-third of total AV for the district.

Financing districts are created by the city or county in which they are located. Financing districts work well for landowners seeking to fund the share of a resilient infrastructure project associated with direct benefits, such as protection from floods. City and county public revenues, discussed below, are more applicable to the share of projects that provide less clearly measured benefits, or benefits that are spread over the entire jurisdiction.

Special Assessments

Local agencies can form assessment districts to fund the portion of public facilities and services costs that result in a “special” benefit to parcels paying the assessment. A classic example of a “special” benefit project is construction of a sidewalk in front of a single-family home. The assessment formula must specifically account for and exclude the cost of “general” benefits to properties inside and outside the district. Approval requires a majority consent of the assessed landowners weighted by the amount of the assessment. Again, note that projects with multiple benefits are, by definition, projects with “general” benefit.

Examples of the application of a special assessment district to resilient infrastructure in California is through a Geological Hazard Abatement District (GHAD). There are 35 GHADs in the state formed primarily to finance and maintain erosion control improvements, including improvements to protect beachfront properties. GHADs are applicable where benefits are clearly attributable to specific properties. As the scope and scale of the protected properties increases, the separation of special from general benefit becomes more difficult. Large GHADs may have difficulty arranging debt financing because bond counsel may be reluctant to opine on the general versus special benefit allocation lacking clear standards in statute and case law.

Special taxes imposed through community facilities districts (CFDs, see below) have advantages over GHADs because there is no need to distinguish special from general benefit. However, CFDs require two-thirds property owner or voter approval, whereas GHADs only require a simple majority property owner approval.

Special Taxes (Landowner)

Special taxes in the context of a financing district are imposed through a Community Facilities District (CFD). A CFD special tax is levied on parcels within the district, similar to a special assessment; however, there is no need to distinguish special from general benefit. CFDs provide the most flexible tool for channeling benefits that accrue to private landowners and their tenants into funding resilient infrastructure. Consequently, we believe that special taxes are a good potential source of long term project finance.

If the CFD has less than 12 registered voters, then two-thirds of landowners must authorize the special tax, with each landowner’s vote weighted by the size of their parcel. If the CFD has 12 or more registered voters, then two-thirds of voters must authorize the special tax on a one-person, one-vote basis. An advantage of CFDs compared to special assessment districts is that parcels can annex into an existing CFD as long as the annexed parcels follow the same approval requirements.

CFDs provide the most flexible tool for channeling benefits that accrue to private landowners and their tenants into funding resilient infrastructure.

The jurisdiction forming the district has as wide discretion to create the special tax formula to maximize both revenue and landowner support, so long as the formula does not mimic an *ad valorem* approach (percent of assessed value). To fund resilient infrastructure, the CFD can levy special taxes on the basis of exposure to rising sea levels and amount of property protected (e.g. building square footage). Furthermore, the special tax formula can subsidize lower income households or senior citizens. This great flexibility makes CFDs an attractive compared to special assessment districts, in spite of the higher approval hurdle (two-thirds versus simple majority).

CFDs are typically formed by jurisdictions in cooperation with developers seeking to finance infrastructure to support development of undeveloped property. For resilient infrastructure this makes CFDs highly applicable to finance and maintain flood control projects for vacant lands undergoing development.

Property Tax Increment

Property tax increment is a common source of financing where the taxing jurisdiction segregates into a special account the increment generated by increased assessed valuation over and above a base year amount, within the boundaries of a “redevelopment area” designated by the jurisdiction. In California, this was historically done to finance specified public facilities and affordable housing, and occasionally public services, to support economic and social investment in the area. California abolished tax increment funding in 2011 that allowed local redevelopment agencies to capture the increment allocated to other taxing entities within the redevelopment area.

The State does allow limited use of tax increment funding and financing through Enhanced Infrastructure Financing Districts (EIFDs). An EIFD is governed by a Public Finance Authority (PFA) to finance public facilities specified in the Infrastructure Financing Plan (IFP) adopted by the PFA. The PFA may be a joint powers authority to enable participation by multiple agencies, and contribution of revenue sources in addition to the tax increment from participating agencies. Allocation of a participating agency’s increment or any other revenue source to the EIFD is based on the PFA agreement. The governing boards of participating agencies may form the PFA and EIFD and adopt the IFP, and the PFA may expend funds on a pay-as-you-go basis, without any approval of landowners or residents of the EIFD.

Tax increment funding for debt financing is limited to the current annual increment amount less a coverage ratio for security. Issuance of bonds by the EIFD requires a 55 percent approval by registered voters within the EIFD.

The revenue potential of an EIFD depends on (1) the share of increment that participating agencies allocate to the district, and (2) the subsequent growth in the assessed value of property within the district. It will take more years before an EIFD in a developed area with limited redevelopment potential can issue debt compared to an EIFD formed on vacant lands that quickly undergo new development.

For resilient infrastructure, EIFDs offer a useful tool particularly for areas undergoing redevelopment or new development. However, unlike special assessments and special taxes, tax increment funding is revenue that otherwise would be available for general purposes. The usefulness of EIFDs depends directly on a potential participating agency’s perceived need for future general-purpose revenue.

EIFDs are a long-term reimbursement mechanism; because of the long time it can take for property tax increment to grow, they are not suitable for either predevelopment funding or project finance.

Development Impact Fees

Development impact fees are one-time charges on a new development project typically paid at time of building permit issuance to fund public facilities required to accommodate the project. Fees must bear a reasonable relationship to the facilities required, be expended on the facilities for which they are collected, and be proportional to the impact of the development project. Revenue fluctuates with the amount of development.

Land use entitlement entities such as cities and counties control funds accumulated from development impact fees. Development impact fees can play a large role in funding infrastructure for “greenfield” development in suburban settings. In urban areas impact fees tend to be a more limited funding source because infrastructure needs are dominated by maintaining existing facilities and serving existing developed areas. Thus, for resilient infrastructure, the variable funding from impact fees may be most applicable for a portion of predevelopment costs, representing new development’s fair share of benefits received from the capital project once implemented.

Public Enterprises

Water, Sewer, and Storm Water Rates and Charges

Rate setting for water, sewer and storm water utilities in California is controlled by a process commonly referred to as “Prop. 218,” named after the 1996 statewide voter-approved proposition called the “Right to Vote on Taxes Act.” For these utilities, rate increases require the governing board to (1) notice all ratepayers of a proposed rate increase, and (2) hold a public hearing and consider written protests to the rate increase. Unless a majority of all ratepayers protest the increase, the governing board may proceed with the rate increase. Achieving a majority protest, particularly for larger utility districts, is relatively difficult unless the rate increase is highly controversial. Debt issuance may be done by a majority vote of the governing board.

Water, sewer, and storm water utilities with vulnerable assets are one of the most readily available funding source for resilient infrastructure in California.

Significant for resilient infrastructure funding, storm water only this fall received authority through Senate Bill 231 (SB 231) to impose new or increase existing rates under the procedures described above. Prior to this fall, the Prop. 218 processes for storm water utility rates required a simple majority approval from ratepayers through a mailed ballot proceeding.

In the near term there are likely to be state constitutional challenges to SB 231. This uncertainty will hinder debt issuance based on storm water utility rates adopted under these new procedures until these legal issues are settled. Until then, storm water utilities probably will need to continue to use a mailed ballot proceeding to increase rates, particularly if they wish to use the new revenue to secure debt.

A combination of factors makes water, sewer, and storm water utilities one of the most readily available source of funding for resilient infrastructure in California:

- Utilities with vulnerable shoreline assets, such as sewer treatment plants, and have a direct incentive to examine resilient infrastructure solutions.
- Utilities have long-range planning horizons and engineering capabilities to support the extended predevelopment design process often associated with resilience infrastructure projects, and consider systemic solutions that may involve other stakeholders but also reduce adaptation costs.
- Unlike most other new revenue sources discussed in this chapter, increasing utility rates does not require voter or landowner approval.

We believe that where direct benefit can be shown to a public utility, the Bay Area’s public utilities are an excellent source for long term project financing.

The Bay Area’s public utilities also collect development impact fees, making them a good potential source for predevelopment cost funding, as well as long term project finance. Also, Bay Area wastewater utilities are now being encouraged by the State to consider using horizontal levies for certain functions. This potential funding source is discussed in more depth in Chapter 2, under Regional Grant Programs.

Seaport and Airport Revenues

Rates, fees, and charges for seaports and airports, as well as debt issuance, only require action by the governing board. As with other public enterprises, seaports and airports must focus on their enterprise operations and can only indirectly support broader public objectives. Furthermore, seaports and airports have limited revenue potential because unlike utility enterprises they are not monopolies. They must consider the impact of rate increases on the loss of business to competing facilities. The key factor in obtaining support for resilient infrastructure is finding systemic solutions that provide benefits to multiple stakeholders while reducing adaptation costs to the enterprise.

The key factor in obtaining support for resilient infrastructure from a public enterprise is finding systemic solutions that provide benefits to multiple stakeholders while reducing adaptation costs to the enterprise.

As with public utilities, we believe that seaports and airports are a good source of long term project financing. Depending on a seaport or airport's relative cash position, they may also be a source of funding for predevelopment costs. As noted above, there must be a direct benefit from the project to the seaport or the airport.

Other Utilities and Railroads

Electric, gas, and telecommunication transmission lines and railways are also vulnerable infrastructure along the Bay shoreline. Similar to the other public enterprises discussed in this section, these enterprises could participate in funding systemic resilient solutions that benefit multiple stakeholders while reducing enterprise costs. In the case of regulated investor-owned utilities, approval of the California Public Utilities Commission (CPUC) may be required.

Many PG&E power and gas transmission lines are in areas that would be impacted by rising Bay levels. Accordingly, it is reasonable to expect PG&E to pay a portion of the cost for resilient infrastructure designed to mitigate those risks. No process has been established for securing PG&E participation in funding resilient infrastructure. We believe that this important source of funding be addressed by both a direct approach to PG&E and an approach to CPUC.

Privately owned railroad right of way is also located within areas that would be impacted by rising Bay levels. However, while the CPUC regulates safety issues for these railroads, they do not regulate rail rates or any financial matters related to these private railroads. These matters are regulated by the Federal Railroad Administration (FRA).

Because PG&E is fully regulated by the CPUC, we believe that PG&E can be a source of long term project finance for projects that directly benefit PG&E facilities. However, since the Bay Area's two major freight haulers, Union Pacific and BNSF, are financially regulated by the FRA, we do not believe that at present they should be considered a source for any funding for resilient infrastructure.

Highway and Bridge Tolls

Tolls are user fees for transportation infrastructure and have been used to finance highway and bridge infrastructure throughout California. Historically in the Bay Area, tolls have been used only for bridge finance, though recently they are being used to add high occupancy (carpool) lanes to highways.

The Bay Area Toll Authority, operated by the Metropolitan Transportation Commission, manages, invests, and distributes the revenues from the region's seven state-owned toll bridges. A separate special district operates the Golden Gate Bridge. Bay Area voters approved Regional Measures 1 and 2 in 1988 and 2004, respectively, to increase bridge tolls for various highway and transit improvements, as well as bridge seismic retrofits. This fall the State approved a new Regional Measure 3 likely to go on the ballot in 2018 to raise tolls on all seven bridges by up to \$3 to fund [a variety of transportation projects](#) throughout the region. Regional toll measures require approval by a majority of voters across the nine-county Bay Area.

Regional transportation agencies may lead development of resilient infrastructure, with opportunities for cost-sharing through systemic solutions, simply because of the extent of their critical and vulnerable assets.

Future bridge toll measures could conceivably include resilient transportation infrastructure projects. Indeed, much of the Bay shoreline is bordered by vulnerable transportation corridors that may have prohibitive relocation costs. Thus, regional transportation agencies may lead development of resilient infrastructure, with opportunities for cost-sharing through systemic solutions, simply because of the extent of their critical and vulnerable assets.

Local agencies are considering a toll road financing mechanism for infrastructure to improve the resilience of Highway 37 in the North bay. Toll road financing requires state approval, but the legislature has granted it relatively easily. The use of tolls to finance highway corridors has

been more controversial in California than the use of tolls for bridges. Consequently, despite the need, toll road financing for resilient infrastructure in the Bay Area could still require significant community engagement.

In the long run, we view this as an excellent source of potential project financing.

City, County, and Special Districts

As local government fiscal stress has increased, support from state and federal governments has decreased, and the state constitution has given voters a direct say in their taxation, Californians have become accustomed to evaluating the potential value of revenue ballot measures. For the November 2016 election, 430 local agencies sought voter approval of local tax increases, expansions, or extensions. Revenue ballot measures were split about 50/50 between K-12 schools and community colleges on the one hand and cities, counties, and special districts on the other. Of the non-school revenue ballot measures, 73 percent passed. Additional analysis of this and prior election cycle results are available on the [California Local Government Fiscal Almanac](#) website.

Californians have become accustomed to evaluating the potential value of revenue ballot measures.

Special Taxes (Jurisdiction)

Cities, counties, and certain special districts in California have authority to levy a variety of taxes. Taxes that generate the greatest revenue and are most commonly considered as a funding source for new facilities and services are listed below:

- Sales and use tax on retail sales
- Parcel tax on property (flat rate, percent of assessed value).
- Transient occupancy tax on visitor lodging
- Business license tax on businesses
- Utility users tax on utility charges

Special taxes are one of the most powerful tools to fund resilient infrastructure.

If a California city, county, or special district wants to raise a tax and directly pledge the increased revenues to specific uses, that tax increase is a “special tax” and requires two-thirds voter approval. General tax increases that require a simple majority voter approval and do not have a specified use are discussed below. The key advantage of a special over a general tax increase is the ability to secure debt (special tax revenue bonds). The key disadvantage is the higher voter approval margin. This balance is reflected in the November 2016 election cycle described above where 40 percent of local revenue ballot measures were special tax increases and 60 percent were general tax increases

Special taxes are probably one of the most powerful tools as a jurisdiction-wide funding source for resilient infrastructure. The dedicated use of funds suggests this approach over a general tax. And because special districts can span multiple city and county jurisdictions, a special tax can more effectively address larger systemic solutions typically associated with resilient infrastructure. Indeed, countywide special sales taxes have been a dominant source of regional transportation infrastructure funding. Another sign of this approach for the Bay Area is the passage of the Measure AA in June 2016, a \$12 regionwide parcel tax for the San Francisco Bay Area Restoration Authority (SFBRA). The SFBRA is dedicated to wetland and habitat restoration around the Bay, and can incorporate flood management infrastructure as part of their projects.

This form of special taxes is an excellent way of creating a long-term revenue source for project finance.

Ad Valorem Property Tax

The *ad valorem* property tax is a property tax based on a percent of assessed value and can be used only to finance general obligation (GO) bonds in California. GO bonds are historically the most common source of local infrastructure finance and still provide a majority of funds for school facilities in California. A general obligation bond backed by the *ad valorem* tax requires the two-thirds approval of voters in the jurisdiction.

Ad valorem property taxes and GO bonds are only an option for agencies that can impose a property tax, typically only cities, counties, school districts, and a limited number of special districts. Thus, the geographic scale of GO bond financing for resilient infrastructure stops at the county level. This is not the case with special taxes for multi-county special districts, such as the SFBRA discussed above.

The relationship between actual parcel market value and its assessed value for taxation purposes can be weak in California due to Proposition 13, a voter-approved reform of property taxes enacted in 1978. Consequently, the actual allocation of tax burden under an *ad valorem* property tax may differ significantly from the perceived actual benefit from a project.

Ad valorem general obligations are a very traditional source of long term project finance for major facilities in the Bay Area.

General Taxes

General tax increases require a majority vote and can be used for any governmental purpose. General taxes cannot be pledged to any specific capital project or public service. The agency can only account for revenues in the general fund that provides funding for all the agency's basic services.

Although general taxes cannot be used for debt financing, through installment sales and lease-purchase agreements (often called "Certificates of Participation"), local agencies have been able to use general revenues to finance certain public facilities.

Some agencies have used a two-ballot measure strategy that takes advantage of the lower voter approval requirements for general taxes compared to special taxes (see section, below), while providing the voters with some assurance regarding how new revenues will be spent. In this "Measure A+B" approach, Measure A provides authority for the general tax increase. Measure B is an advisory measure for an expenditure plan scaled to the magnitude of the tax increase that, if approved, would provide non-binding guidance to the agency.

General taxes have limited use for resilient infrastructure finance because the use of revenues cannot be specified, with a caveat regarding the use of the Measure A+B approach, described above.

Consequently, while general taxes are easier to approve than special taxes, they are not a reliable long-term revenue source for project finance.

Gas Tax

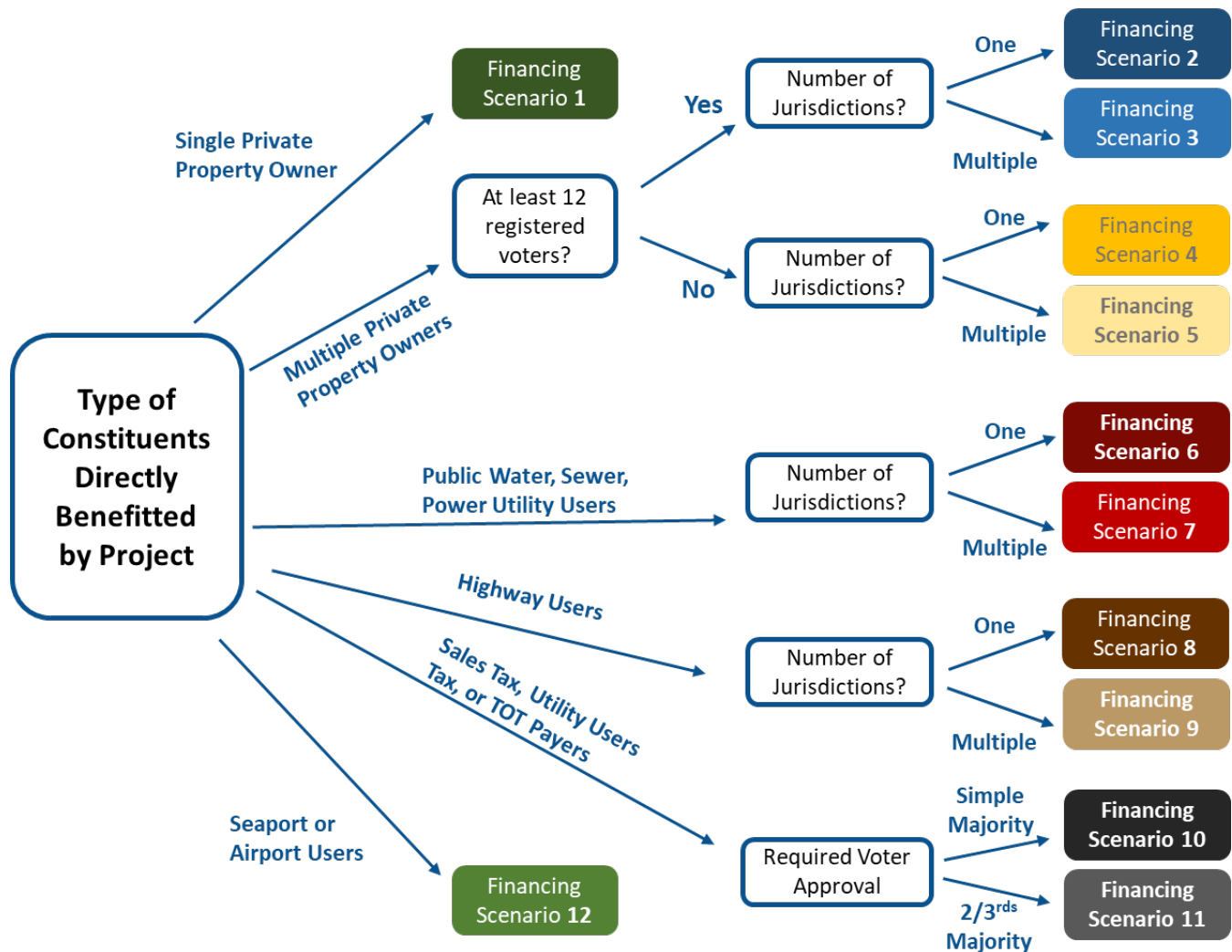
The Metropolitan Transportation Commission (MTC) considered proposing a regionwide gas tax increase of five to ten cents a gallon as recently as 2016. Approval would have required support from two-thirds of voters. MTC decided against moving forward with the gas tax proposal, possibly in lieu of (1) an alternative MTC proposal to increase in bridge tolls (Regional Measure 3 described above), and (2) the legislature's passage of Senate Bill 1 (SB 1) this fall that includes a 12-cent gas tax increase statewide. SB 1 is estimated to increase gas tax revenues statewide by at least \$5 billion per year.

Funding from both the MTC regionwide proposal and SB 1 would be focused on maintenance of existing transportation infrastructure and services, not expansion. These priorities highlight the competition for infrastructure funding between maintenance of existing infrastructure and the need to invest in new solutions. Resilient infrastructure programs will attract more taxpayer support to the extent that it includes maintenance of existing facilities as part of the adaptation strategy. We believe that grants through SB 1 are a realistic potential source for both predevelopment costs and project finance. This is discussed in more detail in Chapter 2.

Resilient infrastructure will attract taxpayer support to the extent that it can include maintenance of existing facilities as part of the adaptation strategy.

THE DECISION TREE FOR PUBLIC FUNDING

The next page has a decision tree for the public finance component of our three main sources of resilient infrastructure funding (public finance, grants, and alternative finance). The purpose of this decision tree is to (1) identify and consolidate the most likely scenarios for project finance for resilient infrastructure in the Bay Area and (2) outline the project financing scenario that is most likely to be successful for each scenario. Note that the decision tree does not address funding for predevelopment costs, but solely addresses public finance options for long term project finance.



The decision tree turns on three main factors:

1. Type of revenue source (e. g. taxes on land, utility rates, etc.)
2. Number of registered voters (e. g. whether authorization is through land owner consent or voter consent)
3. Number of jurisdictions involved (e. g. single jurisdiction or a legal aggregation of multiple jurisdictions).

The following summaries outline the recommended long-term project financing approach for each scenario identified in the decision tree.

Financing Scenario 1

Single private property owner – This scenario is perhaps the easiest financing plan to implement. The key assumption is that a single property needs a resilient infrastructure project to develop their property. California’s Mello-Roos law was adopted in 1986 to address these kinds of needs. Consequently, in Scenario 1, the landowner would work with their local land use entitlement authority to form a community facilities district to fund the resilient infrastructure. The actual special tax mechanism would be custom designed to (1) meet the business plan needs of the developer and (2) provide sufficient security for bond investors. As noted earlier, with special tax authorizations, the actual project

can benefit other parcels besides the original landowners. These other parcels can be required to annex into the community facilities district in the future, should they seek entitlements for new or expanded development.

Financing
Scenario 2

Multiple private property owners within a single jurisdiction with 12 or more registered voters within the proposed district

– Where the proposed taxes for resilient infrastructure would be levied only within one infrastructure, there is a clearer choice between using a special tax measure or an *ad valorem* tax. In this case, the choice should be determined by the relative likelihood of a “customized” special tax passing compared with an *ad valorem* tax. Community engagement is crucial to this decision. Based on our own experience, we believe that for projects like resilient infrastructure, a carefully designed special tax is more likely to pass than an *ad valorem* tax.

Financing
Scenario 3

Multiple private property owners within multiple jurisdictions with 12 or more registered voters within the proposed district

– This scenario is essentially what was done with Measure AA for the San Francisco Bay Restoration Authority. There was a vote of all nine counties in the Bay Area on whether to levy a \$12 per parcel tax to pay for “greening” the Bay. Although the board of supervisors for each of the nine counties had to authorize the vote, the 2/3rds vote requirement was for all nine counties as a whole, and was not a county by county basis. Consequently, if the measure gained a 2/3rds vote in all nine counties as a whole, the measure would be levied in all nine counties, regardless of how each county voted.

If Measure AA had been done as an *ad valorem* tax, as opposed to a “special tax” on each parcel, the measure would have had to get a 2/3rds vote in each county. So, while both *ad valorem* and special tax measures can be done for multi-jurisdiction tax measures where there are 12 or more registered voters, we recommend using the special tax approach where multiple jurisdictions must approve the vote.

Financing
Scenario 4

Multiple private property owners within a single jurisdiction with less than 12 registered voters

– This is a possible scenario for undeveloped property with multiple parcel owners. Again, as with Scenario 5, formation of a community facilities district for the multiple owners is the best option.

Financing
Scenario 5

Multiple private property owners within multiple jurisdictions with less than 12 registered voters

– This is not a likely scenario. This scenario envisions a tax measure for many undeveloped parcels spread across multiple jurisdictions. In this case, a land owner approved community facilities district would be the best alternative. Each of the overlapping jurisdictions would need to approve the district, but one of them would need to take the official role as sponsor for the community facilities district.

Financing
Scenario 6

Public water, sewer, or storm water utility customers within multiple jurisdictions

– This scenario is most likely for sewer utilities, or for new storm water utilities formed under SB 231. The revenue stream would be utility rates, approved under Prop 218. As noted earlier, the Bay Area’s sewer utilities may have the rate capacity already to do some resilient infrastructure financing. In California, multiple jurisdictions can jointly finance infrastructure through what is called joint powers authority (“JPA”). This is a special purpose governmental entity formed by each of the participating government entities. For debt financing, the member entities can legally pledge their revenue, such as sewer or storm water service charges to the JPA. The JPA can then in turn pledge this revenue as security for a bond issue. This would be a realistic option for funding regional resilient infrastructure that directly benefits water, sewer, or storm water utilities.

Financing
Scenario 7

Public water, sewer, or storm water utility customers within a single jurisdiction

– As with Scenario 6, the key revenue source here is utility service charges. Utility service charges are a very strong revenue source, and the easiest new revenue source to authorize. The

challenge is establishing a direct benefit between the resilient infrastructure project and the utility pledging the service charges to debt used to fund the resilient infrastructure.

**Financing
Scenario 8**

Highway users within a single jurisdiction - Scenario 8 is much simpler than Scenario 9. If a resilient infrastructure project can be designed to benefit a roadway solely within one jurisdiction, the community engagement process is more feasible. Only one jurisdiction, with a presumably smaller number of stakeholders, needs to be brought into consensus on the project.

**Financing
Scenario 9**

Highway users within multiple jurisdictions - Scenario 9 is essentially what the Highway 37 collaboration is trying to do—using multiple counties and the State of California (since Highway 37 is a state highway), to set up a toll road authority to fund a \$1 billion+ resilient infrastructure project. The challenge here is community engagement: developing political consensus amongst multiple stakeholders to establish a toll on a highway that has never had a toll on it before.

**Financing
Scenario 10**

Sales Tax, utility users tax or TOT payers with a majority vote - Scenario 10 reflects a single jurisdiction that approves a sales tax increase with majority vote. As noted before, this increase in sales tax cannot be formally pledged to debt, and the annual allocation of revenues to pay debt service on a resilient infrastructure lease financing must compete with all other public services funded by the General Fund of the taxing entity. Scenario 11's scalability is also limited by the need of the taxing entity to pledge real estate equal in value to the amount of lease financing to be done. The resilient infrastructure itself may not be suitable for use as collateral in a credit-worthy lease obligation.

**Financing
Scenario 11**

Sales Tax, utility users tax or TOT payers with a 2/3 vote - Scenario 11 reflects a single jurisdiction that approves a sales tax increase by a 2/3 vote. Consequently, the increase in sales tax revenues can be directly pledged to debt to fund resilient infrastructure without the need for a lease financing. Most importantly, the sales tax revenues from the rate increase can only be used for the purpose designated in the ballot measure, meaning that other public service funding needs cannot compete for these funds.

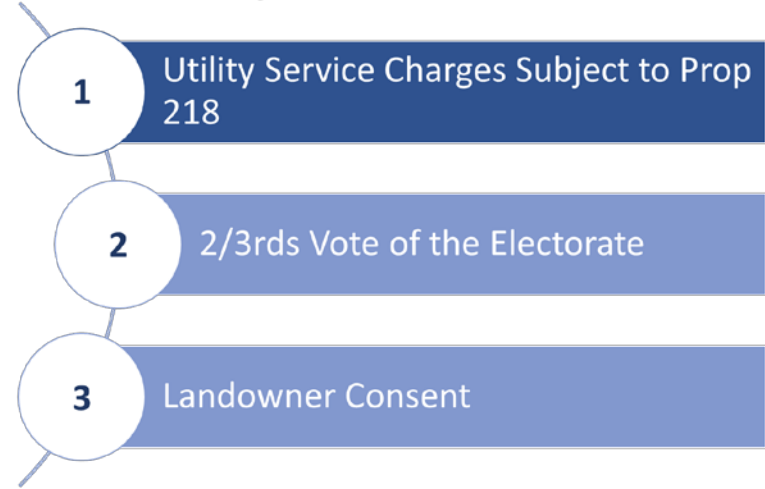
**Financing
Scenario 12**

Seaport or airport users - This scenario is similar to Scenario 8. The ports and airports within the Bay Area are generally considered strong credits and have some bonding capacity. As noted earlier, the community engagement process for a seaport or an airport comprises the management for the facility, but not the users. Again, the challenge is establishing a direct benefit between the resilient infrastructure project and the seaport or airport.

CONCLUSIONS

Of these three basic approaches to creating new revenue sources to fund resilient infrastructure in California, utility service charges under Prop 218 is the easiest. As noted earlier, many public utilities in the Bay Area already have rate/debt capacity under their existing rates. More importantly, Prop 218 essentially just requires an “inverse” majority vote, meaning that a majority of the ratepayers did not formally protest the proposed rate increase. Landowner consent may appear easy, but it de facto means finding a land developer who is willing to fund a resilient infrastructure project to gain development entitlements. This is the challenging part of landowner consent. While securing a 2/3rds vote of the electorate in a given jurisdiction appears daunting, it is done. Success with 2/3rds vote requirements is possible, but requires careful and sustained community engagement.

Three Basic Ways To Create New Revenue Sources



While securing a 2/3rds vote of the electorate in a given jurisdiction appears daunting, it is done. Success with 2/3rds vote requirements is possible, but requires careful and sustained community engagement.

CHAPTER 4: STATE AND LOCAL GRANTS

OVERVIEW

Many California State and Bay Area agencies offer grants or loan support for projects addressing climate change, climate resilience and climate adaptation. We recommend that the design teams focus on five major state and local grant programs, summarized in the table below (six if SB5 is adopted by the voters). These major programs have the most money and typically allocate funds through several agencies. Following the table, is a description of the five programs and reference specific allocations under the applicable agency in the sections that follow. See Appendix A for successful strategies to win competitive government grant programs. Note that this table also evaluates these major grant funding sources for their applicability to both predevelopment cost funding and project finance funding.

Figure 7: Major State and Local Grant Programs

	Approximate Annual Funding Volume	One Time Funding Amount	Availability	Key Project Eligibility Criteria	Regions and Communities of Competition	Funding Pre-Development Costs	Project finance funding
SB 1	\$5 billion per year	N/A	Starts in 2018	Must be part of repair, improvements of roadways	Statewide. Cities, counties, public transit agencies and CalTRANS	Yes	Yes, but one time grant
Cap and Trade	\$2 billion per year	N/A	Now	Climate change mitigation or adaptation	Statewide	Yes	Yes, but one time grant
MTC	\$1.5 billion per year	N/A	Now	Public transit and transportation	Nine county Bay Area	Yes	Yes, but one time grant
Proposition 1	N/A	\$7.545 billion, of which \$2.7 billion may be applicable to RbD projects	Now	Watershed protection and restoration, integrated water management, flood management	Statewide	Yes	Yes, but one time grant
SB 5	N/A	\$3.5 billion, of which at least \$440 million is applicable to RbD projects	If adopted by voters, funds available in 2019	Climate preparedness, habitat restoration and innovation	Statewide	Yes, if adopted	Yes, if adopted
SFBRA	\$25 million per year	N/A	Now	Bay restoration, including flood protection	Nine county Bay Area	Yes	Yes, but one time grant

SB 1 – Gas Tax Increase – The State adopted legislation this calendar year that increases statewide gas taxes by over \$5 billion per year. While this money is primarily intended to address the accumulated deferred maintenance on the State’s roadways, we believe that some of it can be directed to resilient infrastructure where that infrastructure directly benefits an existing State roadway. A more detailed discussion of specific grant programs under SB 1 that might be applicable.

Cap and Trade Revenues – California climate expenditures are among the most significant in the world and this is reflected in the availability of grant dollars, including those from Cap and Trade auction revenues. Consequently, before getting into the details of all the various State grant programs that may apply to resilient infrastructure, it is worth a deeper consideration of cap and trade revenues.

There is an increasing recognition that climate adaptation and resilience projects need funding and much of this funding is coming from the cap and trade program. The recently enacted [AB 398](#) extended the Cap and Trade

program to 2030. The legislation identifies climate adaptation and resiliency as one of the seven priorities for investment of cap and trade revenues.⁸ Passage of AB 398 helped stabilize the cap and trade marketplace and most observers expect available revenues to continue to be significant. Allocations approved in September 2017 of cap and trade auction revenues accumulated in the Greenhouse Gas Revenue Fund topped \$1.5 billion. The Governor's budget for FY 2017-18 assumes \$2 billion per year in Cap and Trade revenues.

Most of the cap and trade spending is fixed per statutory formulas, but much is left to negotiation in the annual budget cycle. There is some discretion as the budget gets negotiated, but cap and trade spending generally adheres to spending priorities outlined in the State [Cap and Trade Investment Plan](#). Given the sums involved, the negotiations can be quite robust. Some agencies, such as the Strategic Growth Council, are now receiving reasonably predictable funding from Cap and Trade revenues.

Besides the [Investment Plan](#), there are other documents applicants could consider reviewing as they familiarize themselves with grants and the grant application process. The current draft of the [Funding Guidelines](#) document serves as a detailed primer on the inter-relationship between various climate spending priorities, including assuring co-benefits for residents of disadvantaged communities, low-income communities, and low-income households. Updated information on cap and trade expenditure programs and plans can be found on the ARB [California Climate Investments](#) website.

Cap and trade is not the only source of funds. State adaptation and resilience programs have received funds from voter-approved resource-related bond measures as well as the normal state budget process.

Metropolitan Transportation Commission (MTC) Grants – MTC allocates approximately \$1.5 billion per year in both operating and capital related grants for transportation in the nine county Bay Area. While both the need and competition for this money is very strong, resilient infrastructure projects that have a direct benefit to key Bay Area transportation corridors have a good chance of getting some grant support through MTC. This funding source is discussed in more detail in the section in this chapter on Regional Grant Programs.

Proposition 1 Funding – California Proposition 1, the Water Bond (Assembly Bill 1471), was approved by the voters on the November 4, 2014 ballot in California as a legislatively-referred bond act. The measure enacted the Water Quality, Supply, and Infrastructure Improvement Act of 2014. Proposition 1 was designed to:

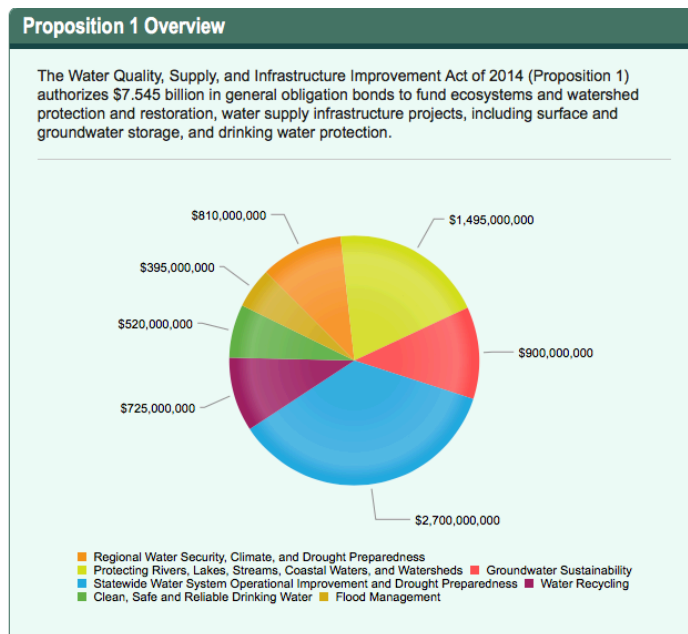
- Authorize \$7.12 billion in general obligation bonds for state water supply infrastructure projects, such as public water system improvements, surface and groundwater storage, drinking water protection, water recycling and advanced water treatment technology, water supply management and conveyance, wastewater treatment, drought relief, emergency water supplies, and ecosystem and watershed protection and restoration.
- Appropriate money from the General Fund to pay off bonds.
- Require certain projects to provide matching funds from non-state sources to receive bond funds.

Specific spending proposals in the proposition included:

- \$520 million to improve water quality for beneficial use, for reducing and preventing drinking water contaminants, disadvantaged communities, and the State Water Pollution Control Revolving Fund Small Community Grant Fund.

⁸ The full list of priorities in AB398 includes: (1) air toxic and criteria air pollutants from stationary and mobile sources, (2) low- and zero-carbon transportation alternatives, (3) sustainable agricultural practices that promote the transitions to clean technology, water efficiency, and improved air quality, (4) healthy forests and urban greening, (5) short-lived climate pollutants, (6) climate adaptation and resiliency, and (7) climate and clean energy research.

- \$1.495 billion for competitive grants for multi-benefit ecosystem and watershed protection and restoration projects.
- \$810 million for expenditures on, and competitive grants and loans to, integrated regional water management plan projects.
- \$2.7 billion for water storage projects, dams, and reservoirs.
- \$725 million for water recycling and advanced water treatment technology projects.
- \$900 million for competitive grants and loans for projects to prevent or clean up the contamination of groundwater that serves as a source of drinking water.
- \$395 million for statewide flood management projects and activities.



These funds are administered through the Bay Area Integrated Regional Management Planning process and are distributed through a competitive grant process to projects listed in the IRWMP. Each round of grant funding has different objectives and requirements. Project teams should review the IRWMP to identify previously identified projects with in their area of interest and should work with the identified IRWMP project sponsor. Although much of the funding has been spent or targeted for areas outside of the Bay Area, some funding remains, especially funding for flood control.

Potential SB 5 Funding – The legislature and governor recently approved SB5, a \$7.5 billion resources and climate bond measure to be placed on the June 2018 ballot. If approved by the voters, the measure would allocate over \$440 million to

climate adaptation and resiliency. The measure says eligible projects shall improve a community's ability to adapt to the unavoidable impacts of climate change, improve and protect coastal and rural economies, agricultural viability, wildlife corridors, or habitat, develop future recreational opportunities, or enhance drought tolerance, landscape resilience, and water retention.

Measure AA Grants from San Francisco Bay Restoration Authority –

The [San Francisco Bay Restoration Authority](#) ("SFBRA") is a regional agency created to fund shoreline projects that will protect, restore, and enhance San Francisco Bay through the allocation of funds raised by the Measure AA parcel tax. The Restoration Authority Board will make funding decisions at public meetings based on its enabling legislation and the requirements of Measure AA. The Board may fund projects to protect, restore and enhance the San Francisco Bay, including habitat restoration projects, flood protection projects that are part of a habitat restoration project, and shoreline access and recreational amenity projects that are part of a habitat restoration project. It is comprised of a Governing Board of local elected officials, an Advisory Committee to represent the community and public agencies, and staff from state and regional agencies. The San Francisco Bay Restoration Authority has annual revenues of about \$25 million, the great majority of which will be allocated to grants for eligible projects.



STATE GRANT PROGRAMS

Below is a table summarizing major State grant programs that may apply to resilient infrastructure. The left column shows the granting State agency with hyperlinks to the specific agency website describing the grant program. The central column shows the ultimate source of funds for the grant program, and the right column contains a summary of the types of projects eligible for the grant. More detailed discussions of each grant program by agency are after the table. Note that we believe on a preliminary basis that nearly all State grant programs identified below can be applicable to both predevelopment cost funding and project finance.

Figure 8: Summary of State Grant Programs

Granting Entity	Source of Funds	Type of Projects
California Air Resources Board	Cap and trade	Climate related projects
California Coastal Conservancy - Climate Ready Program	Cap and trade	Adaptation planning and natural infrastructure
California Coastal Conservancy - Proposition 1	Proposition 1	Watershed protection and restoration
California Coastal Conservancy - Marin County Program	Buck Fund	Nature based adaptation projects in Marin County
Department of Fish and Wildlife	State appropriation	Wetland restoration
Department of Housing and Community Development - Affordable Housing and Sustainable Communities Program	State appropriation	Infill and compact development that reduce greenhouse gases
Department of Housing and Community Development - Housing Related Parks Program	State appropriation	Parks and recreation facilities for affordable housing
California Ocean Protection Council	Proposition 1	Storm water recapture, wetland, and coastal watershed restoration
Department of Parks and Recreation	State appropriation	Wetlands creation, acquisition, or restoration
California Transportation Commission	SB 1 Transportation Improvement Fee	Transit and rail improvement projects, including improving reliability and habitat protection
Department of Transportation	State appropriation	Adaptation planning
Natural Resources Agency	Highway Users Tax Account	Mitigation of environmental effects of transportation facilities
Department of Water Resources	Primarily Prop 1	Flood control and environmental restoration related to drinking water
Strategic Growth Council - Transformative Climate Communities Program	Cap and trade	Neighborhood level greenhouse gas reduction programs
Strategic Growth Council Affordable Housing and Sustainable Communities	Cap and trade	Transit oriented development that reduces greenhouse gases
Water Resources Control Board Division of Financial Assistance	Primarily Prop 1	Watershed protection and non-point source pollution control
Wildlife Conservation Board	Cap and trade, some State appropriation	Climate adaptation related to the protection and restoration of wildlife habitat

While there isn't a single repository of grant information for all state agencies, several state agencies maintain websites listing funding opportunities for a variety of programs, including those addressing the impacts of climate change. A particularly useful website is the "[Funding Wizard](#)", a searchable database of grants, rebates, and incentives. The wizard's team combs the internet for funding opportunities in categories such as energy, air quality and climate change, transportation, urban development, waste management, and water.

California Air Resources Board



The main source of ongoing funds for climate related projects comes from the California Cap and Trade Program administered by the [California Air Resources Board](#). The Board regularly prepares an "Investment Plan" for cap and trade funds. The [Investment Plan](#) provides much background on spending and future plans. Other sources include environmental and resource bonds passed by the voters or annual budget appropriations. The California Air Resources Board [maintains a list](#) of Cap and Trade funds available for grants.

California Coastal Conservancy



Coastal
Conservancy

The [California Coastal Conservancy](#) has list of [current grant opportunities](#) that include:

1. [Climate Ready Program](#) The Coastal Conservancy's Climate Ready Program is helping natural resources and human communities along California's coast and San Francisco Bay adapt to the impacts of climate change, such as rising sea levels, beach and bluff erosion, extreme weather events, flooding, increasing temperatures, changing rainfall patterns, decreasing water supplies, and increasing fire risk. The Conservancy is also working to capture greenhouse gases from the atmosphere through the conservation of natural and working lands. The program recently received \$4 million in cap and trade funds for future funding cycles. Past cycles have included fund for adaptation planning and natural infrastructure.
2. [California Coastal Conservancy Proposition 1 Grants](#) Proposition 1 grants fund multi-benefit ecosystem and watershed protection and restoration projects. Priority project types include: water sustainability improvements, anadromous fish habitat enhancement, wetland restoration and urban greening. There are several upcoming funding cycles for the grants.
3. [Nature Based Solutions in Marin County](#) – The Coastal Conservancy has received funds from the Buck Foundation for The Advancing Nature-Based Adaptation Solutions grant program. The program seeks to support planning, design, permitting, implementation, education, and/or community-based restoration activities to address the risks and impacts of climate change and sea level rise; and to further advance nature-based adaptation solutions to protect and enhance the Marin County bay shoreline and outer coast. Check the website for funding cycles.

Department of Fish and Wildlife



The [Department of Fish and Wildlife](#) just received a \$15 million appropriation to be used for wetland restoration projects that will be managed to maintain benefits for at least 50 years, underpinned by conservation easements or equivalently enforceable conservation agreements that endure at least for at least 50 years. The Department of Fish and Wildlife prioritizes projects with longer environmental benefits.

Department of Housing and Community Development



The [Department of Housing and Community Development](#) has grant programs that potentially intersect with resilience/adaptation projects, especially if there is housing involved. The current grant opportunities [are listed on the Department's website](#) and regularly updated and regularly updated as new funding becomes available. Among the grants that might be of interest are:

1. The [Affordable Housing and Sustainable Communities Program](#) funds land use, housing, transportation, and land preservation projects that support infill and compact development and reduce greenhouse gas (GHG) emissions. Funds are available in the form of loans and/or grants in two kinds of project areas: Transit Oriented Development (TOD) Project Areas and Integrated Connectivity (ICP) Project Areas. There is an annual competitive funding cycle
2. The [Housing-Related Parks Program](#) funds the creation of new park and recreation facilities or improvement of existing park and recreation facilities that are associated with rental and ownership projects that are affordable to very low- and low-income households. Grant funds are made available to local jurisdictions.

California Ocean Protection Council

The [California Ocean Protection Council](#) oversees a portion of funding from The Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Prop 1). Funding from Prop 1 is intended to fund projects that meet the goals of the Water Action Plan provide more reliable water supplies, restore important species and habitat, and develop a more resilient and sustainably managed water system (water supply, water quality, flood protection, and environment) that can better withstand inevitable and unforeseen pressures in the coming decades.



According to their website another round of funding will occur in 2018: OPC had originally planned to solicit projects for Round 2 of the Proposition 1 funding process in May 2017. Staffing capacity issues have resulted in a revised timeline; **OPC now anticipates updating its Proposition 1 grant guidelines in Fall 2017 and announcing a solicitation for projects in early 2018.** Additional information on Round 2 and OPC's Proposition 1 Grant Program will be posted to OPC's website as the updated process gets underway. To give a sense of what qualified during past funding cycles, here is information from the OPC prior guidelines: Eligible planning grants are those that will lead to the successful design of implementation projects. These efforts may include project development, implementation strategy development, watershed assessments, and project-specific activities such as design, baseline data collection, permitting, and environmental review.

Planning grants are intended to support the development of projects that are likely to qualify for future implementation funding. Other examples of eligible projects are those that fund construction of restoration and enhancement projects and new or enhanced facilities. Projects that have qualified for funding in the past include: storm water capture systems, wetland restoration, water pollution prevention and protection/restoration of coastal watersheds.

Department of Parks and Recreation

Among the grant funds available through the [Department of Parks and Recreation](#) are [Land and Water Conservation Fund grants](#) that can be used for a variety of purposes, including wetlands creation, expansion or acquisition.



California
Department of
Parks and Recreation

California Transportation Commission



SB1, which was passed by the legislature and signed into law in April 2017, created several new revenue streams for transportation-related projects under the California Transportation Commission. One of them, the Transportation Improvement Fee, will begin generating an estimated \$1.5 billion annually beginning January 1, 2018. If SB1 survives a repeal initiative planned for the November 2018 statewide ballot, substantial additional funding from SB1 sources will be available to climate change-related projects under two programs, the Transit and Intercity Rail Capital Program and the Solutions for Congested Corridors Program. Both funding streams are competitive programs that receive project funding applications biannually. TIRCP applicants must be entities that run passenger rail or bus programs; and applicants to the Congested Corridors Program must be county or regional transportation agencies or Caltrans. Project elements may include restoration or preservation work that protects critical habitat or open space and projects that improve reliability of transit systems and service. The first program of projects under the Congested Corridors program and the third round of TIRCP projects are scheduled to be adopted by the California Transportation Commission in May 2018.

Department of Transportation

The [Department of Transportation](#) (Caltrans) has [new funding](#) intended to support regional sustainable communities strategies and ultimately achieve the State's greenhouse gas reductions targets of 40 and 80 percent below 1990 levels by 2030 and 2050, respectively. Available funds include:



1. \$25 million annually for Sustainable Communities Grants to encourage local and regional planning that further state goals, including, but not limited to, the goals and best practices cited in the regional transportation plan guidelines adopted by the California Transportation Commission.
2. \$20 million over three years for Adaptation Planning Grants to local and regional agencies for climate change adaptation planning.

Natural Resources Agency



The [California Natural Resources Agency](#) oversees several grant programs, including the [Environmental Enhancement and Mitigation \(EEM\) Program](#). This program, authorizes the legislature to allocate up to \$7 million each fiscal year from the Highway Users Tax Account (Motor Vehicle Revenues, Section 2100). EEM projects must contribute to mitigation of the environmental effects of transportation facilities. The Agency prescribes procedures and criteria to evaluate grant applications and submits a list of projects recommended for funding to the California Transportation Commission (CTC). The CTC awards grants to projects from the Agency's list.

Department of Water Resources

The [Department of Water Resources](#) has had [grant programs](#) for flood control, drinking water, environmental restoration, and other related projects. Consult their website to see if there is current funding applicable to Bay Area mitigation or adaptation.



Strategic Growth Council

The [Strategic Growth Council](#) (SGC) has become one of the key grant makers for local climate actions. SGC coordinates interagency efforts and partners with local and regional government stakeholders to promote sustainable development, improving air and water quality, protecting natural resources and agricultural lands, and reducing greenhouse gas emissions. The Council administers the Transformative Climate Communities Program, the Affordable Housing and Sustainable Communities Program and the Sustainable Agricultural Lands Conservation Program, developing guidelines, reviewing applications, and providing funding as part of greenhouse gas reduction efforts associated with cap and trade funds. The Council also administers a technical assistance program to support all Greenhouse Gas Reduction Fund programs to assist in the development of



CALIFORNIA
STRATEGIC
GROWTH
COUNCIL

projects that maximize greenhouse gas reductions. The Council is charged with review of the California 5-Year Infrastructure plan and with making grants and loans to institutions for planning and implementing land uses that achieve the goals of the State's Planning Priorities. The Council also oversees the Administration's Health in All Policies program, and sponsors research on infill development, conservation, and other planning issues.

[Transformative Climate Communities Program](#) - The Transformative Climate Communities Program funds projects that reduce greenhouse gas (GHG) emissions through the development and implementation of neighborhood-level transformative climate community plans that include multiple, coordinated GHG emissions reduction projects that provide local economic, environmental, and health benefits to disadvantaged communities. The Program will fund two types of grants: Implementation Grants and Planning Grants.

[The Strategic Growth Council's Affordable Housing and Sustainable Communities](#) (AHSC) Program provides grants and affordable housing loans for compact transit-oriented development and related infrastructure and programs that reduce greenhouse gas ("GHG") emissions. These projects increase the accessibility of housing, employment centers, and key destinations via low-carbon transportation options (walking, biking, transit) resulting in fewer vehicle miles traveled (VMT) and mode shift.

California State Water Resources Control Board

The Division of Financial Assistance (DFA) of the California State [Water Resources Control Board](#) administers the implementation a [financial assistance programs](#), that include loan and grant funding for construction of municipal sewage and water recycling facilities, remediation for underground storage tank releases, watershed protection projects, nonpoint source pollution control projects, etc. DFA also administers the Operator Certification Program.



Wildlife Conservation Board



The primary responsibilities of [Wildlife Conservation Board](#) (WCB) are to select, authorize and allocate funds for the purchase of land and waters suitable for recreation purposes and the preservation, protection, and restoration of wildlife habitat. WCB approves and funds [programs](#) that set aside lands within the State for such purposes, through acquisition or other means, to meet these objectives. WCB can also authorize the construction of facilities for recreational purposes on property in which it has a proprietary interest.

WCB accepts proposals on a continuous basis, and will notify applicants about whether the proposal is acceptable or complete. All proposals will be evaluated with assistance from the California Department of Fish and Wildlife. If a proposed project is accepted, and funding is available, a grant agreement or contract will be prepared for the applicant, and the proposal will be scheduled for consideration at a future WCB meeting.

Among their funding sources, WCB was recently allocated \$20 million in Cap and Trade funds for climate adaption projects that will result in enduring benefits. Eligible applicants include local governments, park and open-space districts, resource conservation districts, private landowners, and nonprofit organizations. At least 60 percent of the funds appropriated in this item shall be made available for grants for conservation easements and long-term conservation agreements that conserve natural and working lands for at least 50 years for the benefit of climate adaptation and resilience. The funds appropriated in this item may also be used to develop and implement natural and working lands adaptation and resiliency planning that prioritizes the conservation and management of natural and working lands, technical assistance for natural and working land managers, and efforts that improve rural-urban coordination on climate change adaptation.

REGIONAL GRANT PROGRAMS

Metropolitan Transportation Commission (MTC) Grants

MTC is the transportation planning, financing, and coordinating agency for the nine-county San Francisco Bay Area. Funding for transportation projects are identified in the Regional Transportation Plan (RTP). The Transportation Improvement Program (TIP) lists the near-term transportation projects, programs, and investment priorities of the region's surface transportation system that have a federal interest along with locally and state-funded projects that are regionally significant. To receive transportation funding, projects must be listed in the TIP.

In addition to the TIP which lists all the near-term transportation projects, MTC's One Bay Area Grant program – or OBAG—is a funding approach that targets project investments in Priority Development Areas (PDAs) and rewards cities and counties that approve new housing construction. Cities and Counties may use OBAG funds to invest in: Local street and road maintenance, street scape enhancements, bicycle and pedestrian improvements, transportation planning, Safe Routes to School projects and PDAs.

OBAG2 is the second round of OBAG funding and is projected to total roughly \$916 million to fund projects from 2017-18 through 2021-22. The OBAG2 program is divided into a Regional Program, managed by MTC, and the County Program, managed by the nine Bay Area Congestion Management Agencies(CMAs).

Through the regional OBAG program, MTC has allocated \$10 million to pilot a fund to support affordable housing where it currently exists, referred to as the Naturally-Occurring Affordable Housing (NOAH). Additional funding includes a “80K by 2020” \$30 million challenge grant program to incentivize local jurisdictions to produce affordable housing in PDAs and Transit Priority Areas (TPAs).

Bay Area Wastewater Utilities

The State of California Water Quality Control Board is working with Bay Area wastewater utilities that discharge to the Bay to develop multi-benefit “green” projects as alternatives to traditional wastewater treatment. The multi-benefit concept includes protection against rising Bay levels. At present, the Bay Area Clean Water Agencies joint powers authority (BACWA) is funding baseline science and feasibility work on this concept. This may be a source of predevelopment funding for resilient infrastructure projects.

San Francisco Bay Restoration Authority

Measure AA grants from the Authority were described in the overview section at the start of this chapter.

CHAPTER 5: FEDERAL GRANTS

The table below summarizes each of the applicable Federal grant programs to consider as funding sources for resilient infrastructure. The table is followed by a summary of the grant programs offered by each of these Federal Agencies. See Appendix A for successful strategies to win competitive government grant programs.

Figure 9: Federal Grant and other Funding Programs

Federal Grant Program	Sponsoring Agency*	Requires Declared Disaster	Eligible Projects
Hazard Mitigation Grant Program	FEMA	Yes	Reduction of flood risk
Pre-Disaster Mitigation Program	FEMA	No	Reduction of flood risk
Flood Mitigation Assistance Program	FEMA	No	Reduction of flood risk
National Disaster Resilience Competition	HUD	No	Reduction of disaster risks
Community Development Block Grants	HUD	No	Resilient community improvements
Regional Resiliency Assessment Program	Homeland Security	No	Planning for resilient infrastructure
Coastal Resilience Grants	NOAA	No	Resilient coastal infrastructure
Office of Coastal Management Grants and Cooperative Agreements	NOAA	No	Coastal resilience planning
National Sea Grant College Program	NOAA	No	Coastal resilience planning
Standard Projects; Continuing Authority Program	ACE	No	Reduction of storm & flood risk, beneficial use of sediment, aquatic ecosystem restoration
Planning Studies	ACE	No	Areawide studies not focused on a specific project
San Francisco Bay Water Quality Improvement Fund	EPA	No	Restore wetlands and watersheds, and reduce polluted runoff
Water Infrastructure and Resiliency Finance Center	EPA	No	Information center for drinking water, wastewater, and storm water infrastructure finance

*Acronym Key: FEMA refers to the Federal Emergency Management Agency; HUD refers to the Department of Housing and Urban Development; NOAA refers to the National Oceanographic and Atmospheric Agency; ACE refers to the Army Corps of Engineers; and EPA refers to the Environmental Protection Agency.

FEDERAL EMERGENCY MANAGEMENT AGENCY

FEMA manages five programs designed to reduce the risk to individuals and property from natural hazards while simultaneously reducing reliance on



FEMA



Federal disaster funds (FEMA, 2015). The **Hazard Mitigation Grant Program (HMGP)** provides funds to States, Territories, Indian Tribal governments, local governments, and eligible private non-profits (PNPs) following a Presidential major disaster declaration. The **Pre-Disaster Mitigation (PDM)**, **Flood Mitigation Assistance (FMA)**, **Repetitive Flood Claims (RFC)**, and **Severe Repetitive Loss Pilot (SRL)** programs may provide funds annually to States, Territories, Indian Tribal governments, and local governments. The following discussion focuses on the HMGP, PDM and FMA programs, since it is not likely that the RFC and SRL programs are applicable to funding resilient infrastructure in the nine county Bay Area.

The table below demonstrates a historical 2006-2010 distribution of the substantial funding available through these five FEMA programs.

Figure 10: HMA Funding 2006-2010



Hazard Mitigation Grant Program



Hazard Mitigation Grant Program (HMGP) is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (the Stafford Act), Title 42, United States Code (U.S.C.) 5170c. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. HMGP is available, when authorized under a Presidential major disaster declaration, in the areas of the State requested by the Governor. The amount of HMGP funding available to the Applicant is based upon the estimated total Federal assistance to be provided by FEMA for disaster recovery under the Presidential major disaster declaration.

Eligible Applicants and Projects

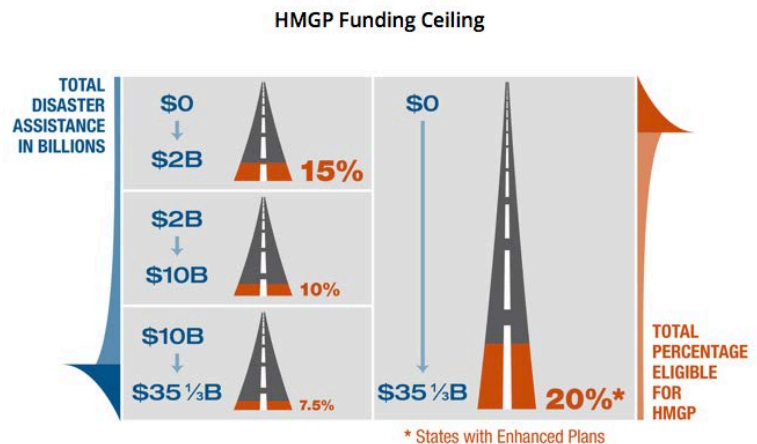
Eligible applicants are state and local governments, Indian tribes or tribal organizations, and certain nonprofit organizations. Individual homeowners and businesses may not apply directly to the program; however, a community may apply on their behalf.

HMGP funds may be used to fund projects that will reduce or eliminate the losses from future disasters. Projects must provide a long-term solution to a problem, for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood. In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. Examples of projects include, but are not limited to:

- Acquisition of real property for willing sellers and demolition or relocation of buildings to convert the property to open space use
- Retrofitting structures and facilities to minimize damages from high winds, earthquake, flood, wildfire, or other natural hazards
- Elevation of flood prone structures
- Development and initial implementation of vegetative management programs
- Minor flood control projects that do not duplicate the flood prevention activities of other Federal agencies
- Localized flood control projects, such as certain ring levees and floodwall systems, that are designed specifically to protect critical facilities
- Post-disaster building code related activities that support building code officials during the reconstruction process

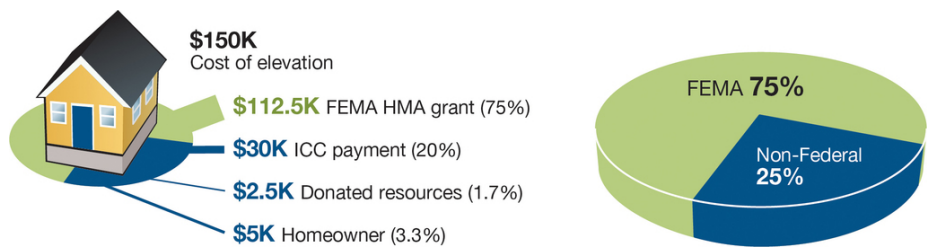
Availability of Funding and Process

HMGP funding is allocated using a “sliding scale” formula based on a percentage of the estimated total Federal assistance under the Stafford Act, excluding administrative costs for each Presidential major disaster declaration. Depending on the size of the disaster HMGP can provide up to \$35.333 billion in assistance. HMGP funding is generally 15% of the total amount of Federal assistance provided to a State, Territory, or federally-recognized tribe following a major disaster declaration.



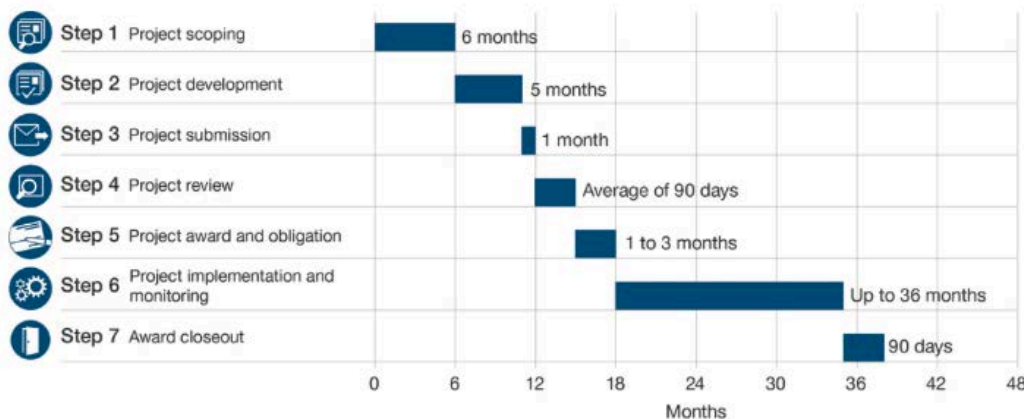
HMGP Cost-Share Example

While FEMA provides up to 75 percent of the funds for mitigation projects, the remaining 25 percent can come from a variety of sources. A cash payment from the state, local government or in some cases directly from the individual is the most direct option. Other sources may include donated resources, such as construction labor; [Increased Cost of Compliance](#) (ICC) funds from a flood insurance policy; or loans from other government agencies, such as the Small Business Administration.



Following a disaster declaration, the State will advertise that HMGP funding is available to fund mitigation projects in the State. Those interested in applying to the HMGP should contact their local government to begin the application process. The HMGP application deadline is associated with each specific Presidential major disaster declaration date and is not part of the annual application period. After a disaster occurs the State will set a deadline for application submittal. For specific application dates please see the [HMGP page](#).

The following graphic shows the seven major HMGP steps with estimated timeline from project scoping to grant award closeout. HMGP grant recipients will have 36 months from the close of the application period to complete the projects.



RbD Bay Area Challenge Project Considerations

Recognizing that the risk of disaster is increasing as a result of multiple factors, including the growth of population in and near high-- risk areas, aging infrastructure, and climate change, FEMA promotes climate change adaptation by incorporating sea level rise in the calculation of Benefit - Cost Analysis (BCA), encouraging floodplain and wetland conservation associated with the acquisition of properties in green open space and riparian areas, encouraging the use of building codes and standards wherever possible.

Further Sources of Information

[FEMA Climate Change Home Page](#)

[Incorporating Sea Level Rise Hazard Mitigation Assistance \(HMA\) Benefit Cost-Analysis Frequently Asked Questions \(FAQs\)](#)

[HMGP Cost Share Guide](#)

[FY 2017 Mitigation Grant Application Cycle – Lessons learned and Best Practices for Application Development](#)

[Catalog of Federal Funding Sources for Watershed Protection](#)

Pre-Disaster Mitigation

The **Pre-Disaster Mitigation (PDM)** program is authorized by Section 203 of the Stafford Act, 42 U.S.C. 5133. The PDM program is designed to assist in implementing a sustained pre-disaster natural hazard mitigation program to reduce overall risk from future hazard events, while also reducing reliance on Federal funding from future disasters.



Eligible Applicants and Projects

Eligible applicants are state and local governments, Indian tribes or tribal organizations, and certain nonprofit organizations. Individual homeowners and businesses may not apply directly to the program; however, a community may apply on their behalf. Sub-applicants must have a FEMA approved mitigation plan as of the application deadline to apply for mitigation projects. More information on eligible applicants and projects can be found on the [FY 2017 PDM Fact Sheet](#).

The following types of projects are eligible for PDM funding:

- Non-flood hazard mitigation projects
- Flood mitigation activities except acquisition, elevation, or mitigation reconstruction
- Acquisition, elevation, and mitigation reconstruction projects
- Generators for critical facilities

Availability of Funding and Process

The total amount of funds that will be distributed under the [FY 2017 PDM Grant Program will be \\$90,000,000](#). All 50 States, the District of Columbia, American Samoa, Guam, Northern Mariana Islands, Puerto Rico, and the U.S. Virgin Islands are eligible to receive an allocation equal to the lesser of 1% of the appropriation or \$575,000, in accordance with Section 203(f)(2) of the [Stafford Act](#). Ten percent of the appropriated PDM funding, or \$10 million, will be set aside for Federally - recognized Native American Tribal applicants to receive an allocation of \$5575,000 per tribe. The balance of PDM Grant Program funds will be distributed on a competitive basis to all eligible applicants. No applicant may receive more than 15 percent, or \$15 million.

Like the HMGP program, the period of performance for the PDM Grant Program begins with the opening of the application period and ends no later than 36 months from the date that FEMA announces the status of the FY 2017 sub-applications.

Applications and sub-applications for the PDM Grant Program must be submitted via the Mitigation eGrants system on the [FEMA Grants Portal](#). The PDM application period opened on August 14, 2017. FEMA will review all grant applications that are submitted through the Electronic Grants (eGrants) system by November 14, 2017, at 3:00:00 p.m. Eastern Time.

RbD Bay Area Challenge Project Considerations

FEMA prioritizes applicants that have received less than \$4million in HMGP funds over those that have received more than \$4 million. Depending on the disaster year, projects submitted by California may be assigned a low priority.

Flood Mitigation Assistance Program

The **Flood Mitigation Assistance (FMA)** program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended (NFIA), 42 U.S.C. 4104c, with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP).



Eligible Applicants and Projects

Eligible applicants are state and local governments, federally-recognized Indian tribes or tribal organizations, and certain nonprofit organizations. Individual homeowners and businesses may not apply directly to the program; however, a community may apply on their behalf. Generally, local communities will sponsor applications on behalf of homeowners and then submit the applications to their State. Eligible community flood mitigation project activities include the following: Infrastructure protective measures, floodwater storage and diversion, utility protective measures, storm water management, wetland restoration and creation, aquifer storage and recovery, localized flood control to protect critical facility, floodplain and stream restoration, and water and sanitary sewer system protective measures. FEMA will select eligible community flood mitigation project sub-applications based on final priority scoring criteria (see table below).

Figure 11: FEMA Flood Mitigation Assistance Program Evaluation Criteria

Priority	Description	Total Points
Private Partnership Cost Share	Cost share taken on by private organizations/businesses emphasizing community participation, collaboration, and investment. Points will be assigned based on percentage of private cost share invested.	150
Building Code Effectiveness Grading Schedule (BCEGS) rating	Assesses effectiveness of enforcement and adequacy of building codes with emphasis on mitigation. Classes weighted based on national class grouping ratings. Highest weight will be assigned to class 1 and descending through lower classes.	100
Community Rating System (CRS) Participation	The Community Rating System (CRS) recognizes and encourages community floodplain management activities that exceed the minimum NFIP standards. Depending upon the level of participation, flood insurance premium rates for policyholders can be reduced up to 45%. Highest weight will be assigned to class 1 and descending through lower classes.	100
Cooperating Technical Partners Program (CTP) Participation	Qualified partnership program where communities commit to collaborate in maintaining up-to-date flood hazard maps and other flood hazard information. Points are provided to CTP participating communities.	100
International Building Codes (IBC) Adopted	IBC adoption epitomizes community commitment to responsible building regulations. Points are provided to IBC participating communities.	50
Total Points Available		500*

Projects submitted for consideration for FMA funding must be consistent with the goals and objectives identified in the current, FEMA-approved State or Tribal (Standard or Enhanced) hazard mitigation plan along with the local or tribal hazard mitigation plan for the jurisdiction in which the activity is located. The FMA program is a competitive grant program and FEMA chooses the applications to be funded based on the Applicant's ranking of the project and the eligibility and cost-effectiveness of the project.

Availability of Funding and Process

Funds are only available to support communities participating in the National Flood Insurance Program (NFIP). The FY17 FMA application cycle will be implemented as it has been in recent application cycles, but will prioritize \$70 million of the \$160 million available under FMA for community flood mitigation projects as Priority 1. This set aside will fund projects for proven techniques that integrate cost effective natural floodplain restoration

solutions and improvements to NFIP-insured properties that benefit communities with high participation and favorable standing in the NFIP. Up to \$100,000 per applicant in Advance Assistance funding will be provided to develop mitigation strategies and obtain data to prioritize, select, and develop viable community flood mitigation projects. This design work will facilitate viable projects for future grant applications.

For Community Flood Mitigation Projects, FEMA will select the highest ranked eligible community flood mitigation sub-application from each Applicant up to \$10,000,000 federal share based on final priority scoring criteria (see table above) and that benefit communities with high participation and favorable standing in the NFIP. FMA funding requires cost sharing and federal funding is available for up to 75 percent of the eligible activity costs.

FEMA announced through a [Notice of Funding Opportunity \(NOFO\)](#) that the Fiscal Year (FY) 2017 application cycle on July 11, 2017. The application period is August 14 through November 14, 2017. The [FY 2017 FMA Fact Sheet](#) provides an overview of the agency's priorities for this year.



Sub-applicants submit mitigation planning and project sub-applications to their State during the open application cycle. After reviewing project and planning applications to determine if they meet the program's requirements, the States, territories, or federally-recognized tribal governments prioritize and forward the applications to their FEMA Regional Office. Planning sub-applications submitted for consideration for FMA funding must only be used to support the

flood hazard portion of State, tribal, or local mitigation plans to meet the requirements outlined in 44 CFR Part 201 Mitigation Planning. FEMA awards FMA funds to State, U.S. Territory, and Federally-recognized tribal Applicants, who in-turn provide sub-awards to local government sub-applicants.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

National Disaster Resilience Competition

The Department of Housing and Urban development oversees the [National Disaster Resilience](#) competition that awards funds for disaster recovery and long-term community resilience. This program allocates Community Development Block Grant National Resilient Disaster Recovery (CDBG-NDR) grant funds through a two-phase competition process. The goals of the program are to apply science-based and forward-looking risk analysis to address recovery, resilience, and revitalization needs.

Eligible applicants are state and local governments, Indian tribes or tribal organizations, and certain nonprofit organizations. Individual homeowners and businesses may not apply directly to the program; however, a community may apply on their behalf. The most recent cycle awarded \$1 billion in funding to various states; the State of California was awarded over \$70 million in funds.

Community Development Block Grants

The objective of the [Community Development Block Grant](#) program is to develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities,

principally for persons of low and moderate income. This program provides relatively flexible funding for community improvement that has a recent history of focus on resilience.

Eligible applicants are state and local governments, Indian tribes or tribal organizations, and certain nonprofit organizations. Individual homeowners and businesses may not apply directly to the program; however, a community may apply on their behalf. The funding level for 2017 is \$3 billion and this program does not require a local government match. Although these funds are federal funds, they can be used as the local match for other federal programs requiring a local match.

DEPARTMENT OF HOMELAND SECURITY: REGIONAL RESILIENCY ASSESSMENT PROGRAM

The Department of Homeland Security's [Regional Resiliency Assessment Program](#) provides a cooperative assessment of specific critical infrastructure within a designated geographic area and a regional analysis of the surrounding infrastructure to addresses a range of infrastructure resilience issues that could have regionally and nationally significant consequences. The goal of the program is to generate a greater understanding and action among public and private sector agencies to improve resilience of critical infrastructure. More information is available on the [RRAP Fact Sheet](#).

NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC AGENCY COASTAL RESILIENCE GRANTS

The [Coastal Resilience Grants](#) is a competitive program to help coastal communities protect themselves from coastal storms. Toward that end, this program funds projects that build resilience, including activities that protect life and property, safeguard people and infrastructure, strengthen the economy, or conserve and restore coastal and marine resources. Recipients include State and local governments and non-profits. In 2017, NOAA awarded \$13.8 million in funding, which was matched by \$8.3 million from local agencies. This program is a combination of two existing grant programs: the Coastal Ecosystem Resiliency Grants Program administered by NOAA Fisheries and the Regional Coastal Resilience Grants Program.

Office for Coastal Management Grants and Cooperative Agreements

The mission of the Office for Coastal Management is to support the environmental, social, and economic well-being of the coast by linking people, information, and technology. The Office's vision is coastal communities becoming more resilient through informed decision-making. This program has a funding level of approximately \$8 million in 2017. Funds received through this program do not generally require a match. Additional details about this grant program [can be found here](#).

National Sea Grant College Program

The [National Sea Grant College Program](#) mission is to enhance the practical use and conservation of coastal, marine and Great Lakes resources in order to create a sustainable economy and environment. Sea Grant accomplishes this mission through research, education, outreach, and technology transfer and works as a partnership between the nation's universities and the National Oceanic and Atmospheric Administration. There are 33 Sea Grant Programs in every coastal and Great Lakes state, Puerto Rico, Lake Champlain, and Guam. Sea Grant serves as a bridge between government, academia, industry, scientists, and private citizens to promote the sustainable use of Great Lakes and ocean waters for long-term economic growth. Funding opportunities are available through national- and state-level competitions.

ARMY CORPS OF ENGINEERS

Congressional authorities for the Army Corps of Engineers (“ACE” or “Corps”) come through periodic approval of omnibus Water Resources and Development Acts, most recently the Water Resources Reform and Development Act of 2014. Authority to support civil resilient infrastructure projects falls under three general types of assistance to state and local agencies and tribes:

- Standard ACE projects
- Continuing Authorities Program
- Planning studies

Standard ACE Projects

Most ACE projects require project-specific authorization and appropriation of funds by Congress. Projects are initiated with a General Investigation Study. Beyond a small initial expenditure of Corps resources, all phases have cost-sharing requirements with a non-federal sponsor (typically a city, county, or tribe). Competition for funding is high and approval depends in part on the benefit-cost ratio of the project.

A candidate for the best example of a resilient infrastructure project for rising bay levels in San Francisco Bay is the [Hamilton Wetlands Restoration](#) project in Novato. The project was a combination of a horizontal levy and wetlands restoration that cost about \$350 million. Of this total, approximately 50% was funded by the Federal government through the ACE. There were two prime categories for this funding through the Corps: Base Reuse and Closing (BRAC) and navigational related programs of the Corps. The key to the navigation side was the use of sediment for the Hamilton Field project from dredging required by the Port of Oakland.

At present, between the fact that BRAC is not likely to be applicable to new resilient infrastructure projects and the current negative attitude of Congress towards climate change infrastructure, we do not believe that the funding package through the Corps for Hamilton Field is replicable. Nevertheless, to the extent that design teams come up with resilient infrastructure projects that benefit navigation issues for a Bay Area seaport, we believe that large scale Corps funding remains a possibility, depending on Congressional support.

Continuing Authorities Program

The purpose of the [Continuing Authorities Program \(CAP\)](#) is to plan, design, and construct water resources projects of limited scope and complexity, and not to address situations requiring large or complex solutions. However, a discrete phase that is part of a larger potential design solution could be a candidate for funding. An example is a current CAP study for the San Francisco shoreline focused on immediate flood risks at several specific points, while the Port is considering a more complex and extensive sea wall replacement solution.

The major advantage of CAP is that it is not dependent on project- specific Congressional appropriations and can be authorized solely by Corps staff. CAP has nine authorities. The most applicable authorities for resilient infrastructure projects include:

- Storm damage reduction (Sec. 103, River and Harbor Act of 1962, as amended)
- Beneficial use of dredge material (Sec. 204, Water Resources Development Act of 1992, as amended)
- Flood damage reduction (Sec. 205, Flood Control Act of 1948, as amended)
- Aquatic ecosystem restoration (Sec. 206, Water Resources Development Act of 1996, as amended)

CAP program grants for the above authorities are capped at \$10 million. With approval of a relatively simple and straightforward request from an eligible non-federal project sponsor, ACE will fully fund an initial feasibility

phase of up to \$100,000. Remaining feasibility costs are shared 50/50 with the project sponsor. Implementation phase costs including final design and construction are typically shared 65/35 (ACE/sponsor).

Planning Studies

The Corps also conducts planning studies using in-house staff. Two programs are 1) Flood Plain Management Services Program and 2) Planning Assistance to States.

Studies typically cost up to \$100,000. Studies are designed to address areawide water resource issues and are not meant to support delivery of specific projects. Nonetheless, an ACE planning study could support RbD projects if additional upfront analysis is required of the general area in which the project may be located. For more information, contact Craig Conner, PAS – FRM Program Manager, US Army Corps of Engineers, San Francisco District, at 415-503-6903 or craig.s.conner@usace.army.mil.

ENVIRONMENTAL PROTECTION AGENCY

The Environmental Protection Agency (EPA) has a range of funding resources that could support development of resilient infrastructure around the Bay. A specific resource, the San Francisco Bay Water Quality Improvement Fund is described below, followed by a general EPA resource for identifying other funding sources.

San Francisco Bay Water Quality Improvement Fund

The EPA manages a competitive grant program to support projects to protect and restore San Francisco Bay. This grant program, known as the [San Francisco Bay Water Quality Improvement Fund](#) (SFBWQIF) began in 2008. Since then the SFBWQIF has invested over \$49 million in 40 grant awards. These projects include over 80 partners who are contributing an additional \$157 million. Emphasis is on technically sound projects to restore wetlands and watersheds, and to reduce polluted runoff. Funding criteria include matching funds at a 1:1 ratio (50 percent of total funding). The SFBWQIF budget is determined by congressional appropriation each year. Available funding has been about \$5 million per year. Awards are highly competitive with over \$35 million in grant applications in FY14.

Water Infrastructure and Resiliency Finance Center

The [Water Finance Center](#) provides financing information to help local decision makers make informed decisions for drinking water, wastewater, and storm water infrastructure to protect human health and the environment. An important focus of the Water Infrastructure and Resiliency Finance Center is encouraging effective use of federal, state, and local funds. The Center 1) builds on the successful Clean Water State Revolving Fund and Drinking Water State Revolving Fund and funding from federal partners and 2) supports innovative financing and coordinated funding of projects to leverage these federal dollars.

The Center provides links to EPA, U.S. Department of Agriculture (USDA), and U.S. Department of Housing and Urban Development (HUD) that are the main sources of federal funding for drinking water, wastewater, and storm water infrastructure.

Other Potential EPA Funding Programs

EPA also can provide grant funding through [Water Pollution Control \(Section 106\) Grants](#), [California Nonpoint Source \(Section 319\) Grants](#), State Wetlands Planning grants and Urban Water grants. These programs have a variety of restrictions but can help fund predevelopment costs for RbD projects. We do not include the EPA's state revolving fund (SRF) program for water and wastewater utilities because this program is (1) for capital projects and (2) is a below market rate loan program that requires a separate repayment source.

CHAPTER 6: ALTERNATIVE REVENUE SOURCES FOR PROJECT FINANCE

This chapter describes the three alternative funding sources for resilient infrastructure in the Bay Area. These sources are “alternative” because they have not been used, or in the case of privately philanthropy, infrequently used, to fund infrastructure in California. Their potential as a funding source is directly related to the unique solutions likely to be associated with a resilient Bay shoreline. The table below summarizes the evaluation each source based on the same criteria used in Chapter 3 for traditional local and regional public funding sources.

Figure 12: Alternative Revenue Sources

Revenue Source	Applicability to Resilient Infrastructure Systems	Security for Debt Financing	Revenue Potential	Community Engagement Required for Authorization
Land Sale or Lease on Reclaimed Lands	NARROW: Few reclaimed land opportunities	No	MODERATE: Depends on location and scale of development	EXTENSIVE: Shoreline development attracts significant public opposition
Avoided Cost Flood Insurance Premiums	MODEEST: RI that reduces risk to limited class of policyholders	Probably; if sufficient number of policyholders participate	LIMITED: But captures value from direct benefits of RI	EXTENSIVE: Requires engagement of existing policyholders and formation of new insurance enterprise
Property and Casualty Insurance Surcharge	BROAD: RI that reduces risks to broad class of policyholders		SIGNIFICANT: Depending on number of policyholders	EXTENSIVE: Requires 2/3 approval of state legislature
Private Philanthropy	NARROW: Funding must "add value" in areas that public funding does not address	No; though small loans on favorable terms are available from impact investors	LIMITED	LIMITED

Note: "RI" is "resilient infrastructure".

LAND SALES OR LEASES ON RECLAIMED LANDS

The impetus to create the Bay Conservation and Development Commission (BCDC) in 1965 came from citizen activists appalled at the extensive, ongoing filling of San Francisco Bay and other environmental impacts. For over fifty years BCDC has regulated development along the shoreline, vastly reduced the amount of fill occurring, supported the restoration of natural habitats, and greatly improved public access to the Bay. Given this history, the alternative funding source described here may be considered improbable. However, at this point in the advance planning process for adaption to sea level rise in the Bay, it makes sense to evaluate all possible options.

Potentially a solution for urbanized locations along the Bay shoreline, a multi-purpose levee (MPL) could provide not only flood control benefits but also a range of public amenities and private development opportunities.⁹ The purpose of including private development is to create land value that can be captured through land sales or leases. This value capture technique provides funding for the underlying infrastructure that makes the development possible. This technique is often used by transit agencies on publicly-owned land around transit stations, and has been used for flood control in cities around the world.

This value capture technique provides funding for the underlying infrastructure that makes the development possible.

MPLs generate challenges for project finance. The actual sale or lease of property would not likely take place until the infrastructure project is complete and private development could begin construction. The long lead

⁹ New York City Economic Development Corporation and Arcadis, *Southern Manhattan Coastal Protection Study: Evaluating the Possibility of a Multi-Purpose Levee*, May 2014, p. 6.

time for the resilient infrastructure projects would make private construction financing infeasible and require public support. Private funding would provide “take out” financing as opposed to construction financing. Under one option, private funding would be occurring as a lump sum at time of development, enabling reimbursement of a portion of construction costs or partial retirement of construction debt. Alternatively, developable property could be leased to developers or long-term tenants, and lease revenues used to refinance construction debt and issue long-term debt.

An MPL could be the type of multi-benefit strategy associated with resilient infrastructure system:

- Accommodate a range of housing needs to address the acute shortage of housing in the Bay Area.
- Assist in reducing risks for existing developed lands on the inland side that otherwise may have difficulty funding the project.
- Incorporate public amenities that otherwise would not be available.
- Provide natural habitat on the Bay side for additional benefits.

Nonetheless, regulatory requirements and environmental opposition could make this type of resilient infrastructure solution difficult to achieve. The question at this stage is whether there are sites along the Bay where this type of solution would at least be economically feasible and provide significant benefits.

COMMUNITY CHOICE FLOOD RISK FINANCING

Over the last decade, California participants in the National Flood Insurance Program (NFIP) have paid about four dollars in premium for every dollar in benefit they have received. As a result, some policy makers are now discussing replacing NFIP in California with a state controlled program. The model being considered is similar to the Community Choice Aggregation (CCA) power authorities used by communities to bundle customers and negotiate the purchase of a higher share of renewable power than otherwise provided through the local utility.

Description

To receive a federally-regulated or insured mortgage, building owners in high risk flood areas are required to purchase flood insurance. The NFIP, administered by the Federal Emergency Management Agency (FEMA) provides flood insurance to many properties because of the lack of affordable private alternatives. Community Choice Flood Risk Financing (CCFRF) would provide residents and businesses with an alternative to NFIP flood insurance.

The source of potential funding for resilient infrastructure is related to NFIP rates that are set by Congress and do not follow generally accepted actuarial procedures. In some areas property owners may pay less than the true actuarial rate while in others that may pay more. The Bay Area falls into the latter category, where flood risks are lower and flood depths are relatively shallow.

CCFRF would seek to attract existing NFIP policy holders with potentially slightly lower premiums, but still high enough to adequately insure risks. The difference between the premium and the actuarial cost of the risk would be invested in resilient infrastructure to further mitigate the flood risk.

A Community Services District (or CFD, see Chapter 3), possibly with minor amendments to the enabling statute, could be used to fund the entire program including flood insurance premiums. The CFD would levy special taxes on all property within the CFD subject to flooding. The entire effort could be governed by the local jurisdiction, or by a new Community Resilience Authority to broaden the capabilities of the risk reduction program (see Appendix A).

The source of potential funding for resilient infrastructure is related to NFIP rates that do not follow generally accepted actuarial procedures

The proceeds of the taxes would be used for the following purposes:

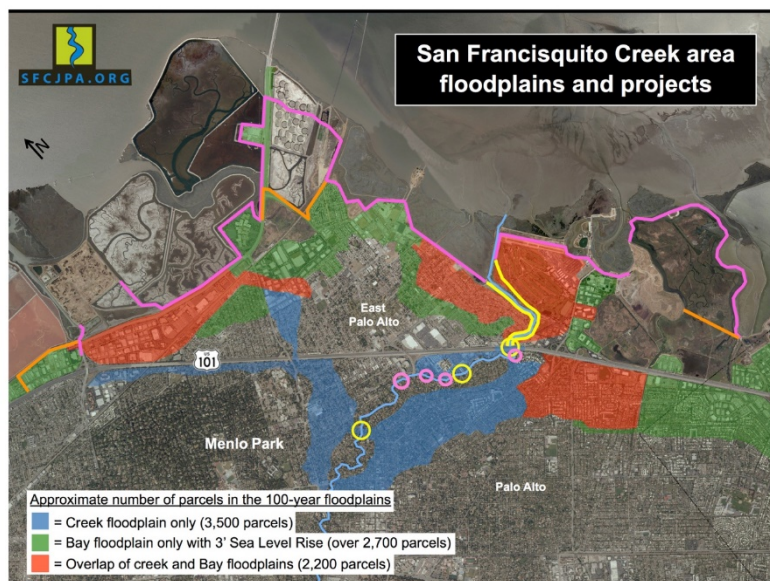
1. Purchase aggregate flood insurance for all properties within the CFD.
2. Pay for maintenance and ongoing improvements to all existing flood control infrastructure within the CFD, or benefitting property within the CFD.
3. Fund on either a pay as you go or debt basis new infrastructure projects that reduce the flood hazard for properties within the CFD.

Formation of the CFD would require a two-thirds approval of registered voters with the district. Alternatively, if there are fewer than 12 registered voters in a potential district, it can be done solely through a landowner consent process. Existing NFIP policy holders would likely support formation to the extent that their insurance costs would decline, and their risks would be reduced. The CFD could be formed across multiple jurisdictions. The challenge would be to draw the CFD boundaries to attract as many other supporters as possible while still achieving the two-thirds vote required to levy a special tax. Property not within the CFD initially could be mandated to annex into the CFD when a parcel owner seeks development entitlements from the jurisdiction. The entire effort could be governed by the local jurisdiction, a joint powers authority possibly through a Geological Hazard Abatement District, or by a separate entity such as a Community Infrastructure Resilience Authority (see Appendix B).

Case Study

The San Francisquito Creek JPA (SFJPA) is a Joint Powers Authority between the cities of Palo Alto, East Palo Alto, Menlo Park, and the counties of San Mateo and Santa Clara. The SFJPA is currently working to upgrade the flood control infrastructure along the San Francisquito Creek (see map, below). When the activities are completed the system will reduce the flood risk for residents in flood prone areas within the JPA.

Figure 13: San Francisquito Creek Flood Plains and Flood Control Projects



There are over 5,500 NFIP policies insuring \$1.4 billion in assets within the SFJPA. Each year these property owners pay \$6.3 million in NFIP premiums (see table, below). Through the NFIP, the rate paid is more than \$4.43 per thousand of total insured value (TIV).

If the JPA instead offered property owners a premium of \$4.00 per TIV, property owners would save an average of \$110 per year. Assuming the JPA could market this risk to commercial carriers for \$3.30 per thousand TIV, based on the true actuarial rate, the JPA could generate about \$1.0 million a year in revenue which could be used to improve the levees.

Figure 14: San Francisco Creek NFIP Policies In Force

	NFIP Policies (number)	Total Insured Value	Annual NFIP Premiums	Average Policy Cost	Average Policy Cost per \$1,000 Insured Value
East Palo Alto City	948	\$225,605,800	\$1,139,020	\$1,201	\$5.05
Menlo Park City	890	\$242,122,200	\$1,071,228	\$1,204	\$4.42
Palo Alto City	3,697	\$964,141,200	\$4,126,198	\$1,116	\$4.28
Total	5,535	\$1,431,869,200	\$6,336,446	\$1,145	\$4.43

STATE-MANDATED INSURANCE SURCHARGE

The Regional Policy Association, an independent, not-for-profit civic organization serving the New York metropolitan area, recently published [a report](#) about a model for governing and funding coastal adaptation. The model includes an Adaption Trust Fund funded by a state-mandated insurance surcharge on all property and casualty policy holders within Connecticut, New York, and New Jersey. In New York the surcharge would generate between \$900 million and \$2.7 billion in proceeds, assuming a rate of 0.5 percent to 1.5 percent of premiums collected over a 10-year horizon. Background analysis for the report evaluated portfolio allocation strategies with a mix of grants and loan products to determine how the fund could become self-sustaining after the surcharge sunsets in 10 years.

Further investigation would be needed, possibly with assistance from the California Department of Insurance, to estimate the revenue potential of a similar surcharge on Bay Area policyholders. The surcharge could be expanded beyond property and casualty lines. Given the passage of Proposition 26 in 2010 (the “Supermajority Vote to Pass New Taxes and Fees Act”), it is likely that imposition of a surcharge would require a two-thirds vote of the state legislature. A governance structure would be required to manage surcharge revenues and determine how to allocate funding for resilient infrastructure projects. See the appendix for one approach, a Community Infrastructure Resilience Authority.

PRIVATE PHILANTHROPY

Private Philanthropy includes funding from a wide range of potential funders, from large national foundations to local community and family foundations and even individuals. Philanthropy often sees a role funding projects where there is significant government funding. However, philanthropy wants to “add value” to public funds to accomplish something that would not otherwise have been possible, rather than simply replacing or augmenting public funding.

In the predevelopment stage, there may be opportunities to secure grant funds that would support innovative designs and approaches if the project makes the case that design support from philanthropy will make it possible to accomplish something that would not be possible without the nongovernment funding. To secure this kind of philanthropic support, predevelopment work will also have to make the case that the project will be able to attract significant public funding based on the design work accomplished.

Impact investors may be willing to fund predevelopment costs if they are secured by a pledge from a local government entity to reimburse the impact investor with interest when and if a long-term revenue source is authorized to fund a resilient infrastructure project.

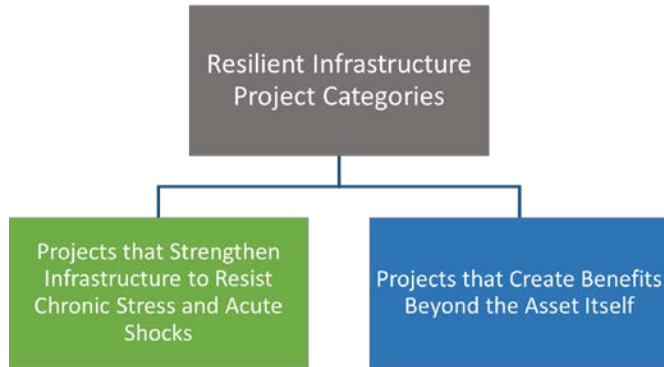
In the context of these resilient infrastructure projects, the following are examples of the types of elements that might be appealing in grant applications to private philanthropy:

- **Community Engagement** – Philanthropy may provide grants to ensure that marginalized communities have a voice in the planning stage.
- **Multiple Benefit Projects** – Philanthropy has been interested in the past several years in the concept of developing prototypes of multi-benefit projects where both human communities and natural communities benefit from the infrastructure. For example, using wetlands to mitigate storm surges. Multiple benefit could also mean an infrastructure project that provides a community park or opportunities for recreation. Philanthropy is interested in supporting park-poor communities.
- **Community Equity** – Philanthropy frequently has a focus on addressing needs that government programs have not served effectively, including marginalized communities. Projects that will reduce the vulnerability and increase resilience of low income or marginalized communities in the face of sea level rise will be appealing to philanthropy. Conceivably there might be ways to engage communities in implementation: for example, a job training program connected to the infrastructure project.
- **Pilots That Can Be Replicated** – Philanthropy often tries to position grants to seed new innovations and demonstrate new approaches. Projects that can credibly demonstrate this potential are appealing. Government funds often cannot take risks, and this is where philanthropy can play a role. Philanthropy does have a focus on helping communities adapt to climate change and there are likely to be opportunities for grants to design and implement innovative projects and approaches that can be demonstrations for other communities.

APPENDIX A: STATE AND FEDERAL FUNDING STRATEGIES

When it comes to large-scale state and federal resources, resilient infrastructure project proposals generally fall into one of two categories.

Category 1: Projects that strengthen infrastructure to resist chronic stresses and acute shocks. Examples include fortified roads or electric power grids that are made of more robust materials or built in ways that better



withstand a hazard, like an earthquake or storm surge. These types of projects are generally eligible for the same types of funds as conventional infrastructure in the same sector. A resilient road and a regular road both can be designed, planned, and built using Department of Transportation (DOT) dollars. Often the biggest challenge for these projects is funding the additional costs associated with greater resiliency.

Category 2: A broader category that includes infrastructure projects that create benefits beyond an asset itself, such as a road that also acts as a

berm to protect a larger area and population behind it. In this case, it is more likely that coastal protection funding sources will cover a greater proportion of the project than transportation agencies, whose rules would make it difficult to justify additional costs.

Knowing which of these two approaches you want to take in seeking state and federal funds is essential to writing successful funding applications. These two different kinds of resilience projects involve very different planning and predevelopment processes, and as a result are suited to different funding sources.

State and federal grants can be excellent early-stage sources of support for large-scale resilient infrastructure projects, but they are not well suited to smaller or incremental solutions. Applying for these kinds of funds is hard. Applications can take an extraordinary amount of time and they often require the dedicated expertise of a government grant writer. The process is generally not worth the effort below a certain grant size. For predevelopment grants that cover planning activities, feasibility studies, and other highly technical prerequisite work for the next stage of design, we recommend that RbD design teams and their project sponsors consider applying for funds in the \$250,000 to \$600,000 range. For project implementation, federal funds are generally best suited for larger-scale multi-year activities in the \$1 million+ range.

There are resources available for dedicated activities (e.g. water monitoring) within a large project. The funds available in these narrow programs vary significantly from under \$50,000 for environmental justice grants up to \$300,000 for brownfields remediation or site clean-up. These grants can be important to a project's success, but they are generally not the best first stop for implementation resources.

There is no obvious single source of funds for RbD projects. Design teams should consider multiple funding sources and ensure that designs provide a strong and clear rationale for pursuing specific types of funds (e.g. water, energy, transportation). Emphasizing multiple communities of benefit and the resilience components of a project can be a major strategic advantage in these applications. However, design teams must be able to quantify and generate relevant data on basic project cost, performance, and benefits to match most applications requirements.

Do's & Don'ts for Seeking State & Federal Funding

- Don't pay attention to new federal funding announcements or proposals in the news. These are not a good indicator of what funds will be available or when. Focus on existing programs with dedicated resources and clear application requirements already in place.
- Look carefully at any federal program for resources available in the relevant fiscal year (FY18 and FY19 are most appropriate for funding applications immediately after the Bay Area RbD process concludes).
- Find and work with a local grant writing expert with grants management experience. Recognize that expertise in writing grants for one type of agency might not be the same as for others, like DOT. Pick the expertise that best matches your anticipated resource needs. Know that you will have to spend money to get (more) money.
- To monitor announcements and calls for applications, sign-up at [grants.gov](https://www.grants.gov), for the federal government, and the "[Funding Wizard](#)" for the State of California.
- Consider how your project can be divided into components that maximize your likelihood of attracting funding. For example, if a site includes a new road/berm and recreational space, consider if/how these pieces could be separated and sequenced so that separate grant applications could be submitted for each. Alternatively, consider how a project could be phased to attract different types of funds along the way.
- Pay attention to sequencing. Consider what activities and project components are essential or prerequisite to others. Prioritize funding applications for the earliest components of the project first. You do not want to receive money for a project component that requires unfunded prerequisite activity.
- Do not confuse a benefit with a revenue.
- A resilience service is not necessarily an infrastructure project. Look carefully at eligibility requirements for every funding source.
- Don't forget about resources for long-term O&M.
- Aim at the right scale. It is hard to get small money from big sources.
- Do not assume that smaller funding amounts mean less paperwork. Most federal and state grant applications are onerous. Timelines for receiving funds can also be highly uncertain. Having a larger funding strategy that recognizes this can be the difference between successfully securing resources instead of ending up with "swiss cheese" and big funding gaps. It can be helpful to partner with a local agency or NGO that utilizes federally required generally accepted accounting standards.
- Good data are essential for successful funding applications at any scale. Wherever possible, consider tapping local technical and academic institutions to support data collection, feasibility studies, detailed scenario analyses, etc. Even if these partnerships are on a pro-bono basis that can be a great source of leverage in funding applications to show local support and serve as sources of matching funds/resources.
- Many of the grant and loan programs are dependent on a budget appropriation that may not be predictable from year to year, so check with the agency involved to determine if funding will be available. Even if the deadline has passed for a grant cycle, future funding cycles are possible.
- Elected officials and nongovernmental organizations affiliated with your agency (e.g. League of Cities), can help identify funding sources, assist with introductions to agencies, and provide important support for your project.

APPENDIX B: COMMUNITY INFRASTRUCTURE RESILIENCE AUTHORITY

The concept of a Community Infrastructure Resilience Authority is a combined premium and fee based approach that coordinates implementation of actions to make essential Bay Area infrastructure networks more resilient. Revenue producing elements of an IRA would include flood insurance premiums and fees for accrual of essential infrastructure asset retirement obligations (ARO).

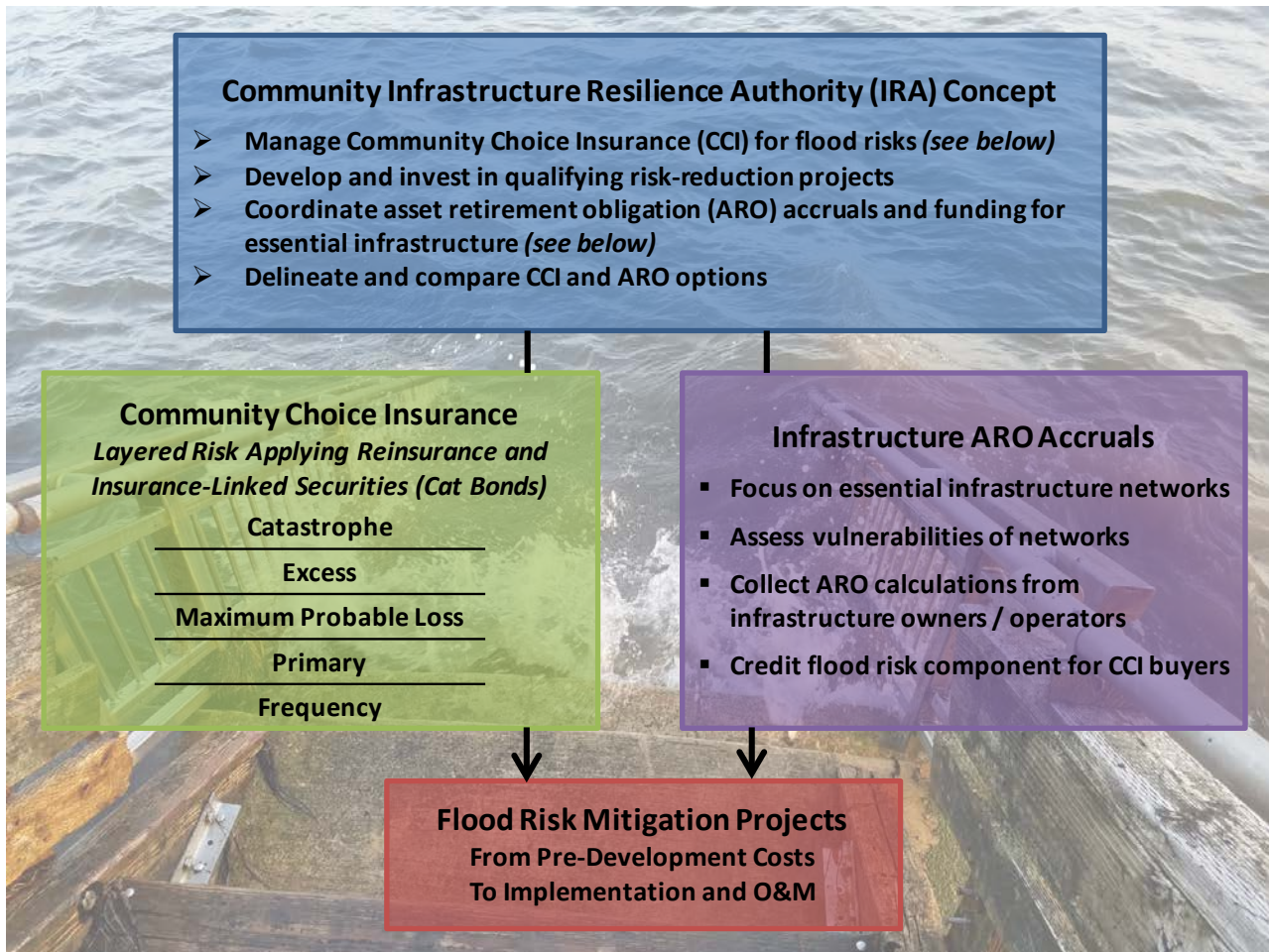
Community Choice Insurance (CCI), as part of a Community IRA, offers the potential to apply flood insurance premiums to a tiered risk transfer program that can satisfy requirements for insurance and invest in flood risk reduction projects. New accounting requirements for public AROs create the opportunity to introduce fiscally responsible ARO fees, while coordinating similar fees related to essential private, regulated infrastructure that is commingled with or connected to essential public infrastructure.

In effect, an IRA offers the potential to delineate an array of choices for flood insurance buyers and users of essential infrastructure, such as water, wastewater, energy, transportation, and communications. Subject to comparisons of specific CCI and ARO choices, credits might be offered to CCI buyers for the flood risk components of applicable AROs, coordinated by the IRA. The fees and premiums derived from the choices would be used to identify and implement the most effective investments in resilient infrastructure networks and flood risk reduction.

Implementation of a Community IRA and CCI in collaboration with a regional governance structure could be supported by experts in risk financing, asset retirement obligations, flood insurance, reinsurance, and catastrophe bonds.

A schematic diagram of a Community IRA is on the following page.

Figure 15: Community Infrastructure Resilience Authority



Why Consider a Community IRA?

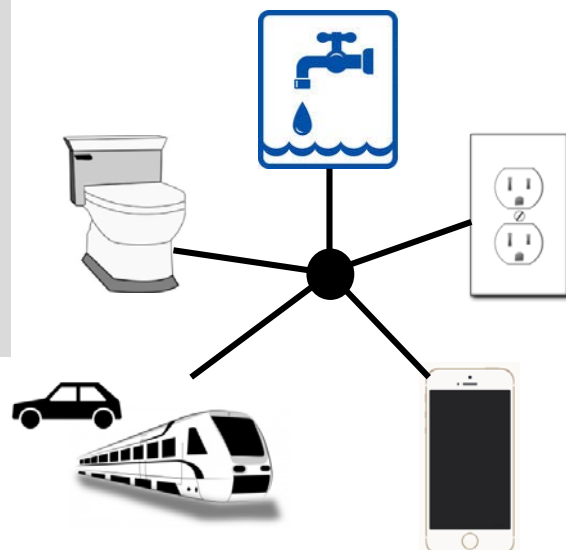
- ✓ Regional: Bay Area **control & coordination**
- ✓ Relatable: CCI funding **based on risk**
- ✓ Scalable: potentially **significant funds** for risk-mitigation investments and long-term solutions
- ✓ Attractive: potentially **enhanced solutions** for property owners needing flood insurance
- ✓ Defensible: fiscally **responsible** fees for AROs
- ✓ Flexible: **choices** among CCI and ARO **options**

Phase-In with Incentives

CCI offers potential to commence funding based on savings for current buyers and enhancements to attract new buyers. As essential infrastructure networks are evaluated and ARO calculations made, a range of economic choices can be developed for comparison, which may further drive CCI adoption.

Environmental Risk & Financial Solutions (ER&FS) advises clients regarding risk-financing alternatives for environmental liabilities and AROs.

www.cleanfinancials.com



**Environmental
Risk & Financial
Solutions**

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Appendix C: Design Team Financing Plans

Resilient by Design Bay Area Challenge

Pages	Design Team Name	Project Area Focus
3-4	Common Ground	Highway 37 and San Pablo Bay
6-13	The Home Team	North Richmond and San Pablo Bay
15	All Bay Collective	San Leandro Bay
17-18	Public Sediment	Alameda Creek
20-27	Field Operations	South Bay Sponge
29-32	Hassell+	South San Francisco
34-37	BIG+ONE+Sherwood	Islais Creek in San Francisco
39-40	Permaculture	Marin City
42-45	Bionic	San Rafael

Resilient by Design Bay Area Challenge

Design Team Financing Plans

Design Team:

Common Ground

Project Area Focus:

Highway 37 and San Pablo Bay

+ FINANCIAL PLAN



RELEVANT FUNDING SOURCES-2018

● STATE - PROP 68 ballot

This is a \$4.1B general obligation fund for improving parks and water supply in CA which includes:

- \$60M competitive grants for nature trails and visitor centers.
- \$30M competitive grants for conservation projects along the Pacific flyway. Our site and near term project - Sonoma Creek Baylands Strategy - Outreach Project qualifies for both of these and the ballot is likely to be passed.

● BAY AREA - Regional MEASURE 3 ballot

This is a \$4.45B fund for highway and transit improvements in toll bridge corridors:

- \$100M for SR 37 improvements (this money is likely to be used to study alternatives and near term fixes for SR 37 which could include our study for Multimodal Public Access study)
- \$150M for closing gaps in SF Bay Trail and improving bike infrastructure.

CALIFORNIA RESILIENCY CHALLENGE

- Sep 2018

NHI CALIFORNIA WATER BOND

- It will invest \$8.87B in California water infrastructure, benefiting people, the environment and agriculture. It is a balanced measure, resulting in improved water supplies for every part of the state. This measure is sponsored by conservation, agricultural, water, and civic organizations.



LONG-TERM OPPORTUNITIES

In order to bring cohesion to existing, yet complex, regional conservation and transportation efforts, there are a number of opportunities to clarify coordination in the region as a means of fostering identity, ecological function, mobility, and economic development. Further, there are a number of potential pathways to consider towards identification of revenue streams that can support future investments in infrastructure and conservation, which include:

- Monetization of conservation efforts and ecosystem services
- Value capture of development potential in neighboring areas such as Vallejo, American Canyon, and the City of San Francisco
- Monetization of avoided losses from damage caused by sea level rise impacts
- Consideration of proceeds from transportation investments, such as fees generated by the implementation of new regional rail
- Quantification of indirect economic impacts generated by an improved identity as a regional tourist destination and gateway towards the Sonoma and Napa Valley regions
- Regional Wetland Mitigation Bank

- Potential Funding/Funders for Near-Term Projects

GOVERNANCE MECHANISM



FUNDING MECHANISM



IDENTIFIED FUNDING STAKEHOLDERS

LANDOWNERS

- Caltrans -state funding: bonds
- SMART - feasibility study, state funding: bonds, measure.
- US Fish & Wildlife Service
- California Department of Fish & Wildlife
- Sonoma Land Trust

TRANSPORTATION

- Solano Transportation Authority - By Others
- MTC - grant to study rail, co-located rail
- Sonoma County Transportation Authority
- Napa Valley Transportat Authority - leading ferry feasibility from Vallejo to Novato

CONSERVATION

- Point Blue (place-based education)
- California Water Board / North Bay Watershed Association
- Sonoma Land Trust
- Ducks Unlimited
- Coastal Conservancy

COMMUNITY ACCESS

- Bay Trail
- Bay Area Water trail
- Greenbelt Alliance
- Sonoma County Regional Parks
- American Canyon Parks Department
- Solano County Parks District (just forming)

APPROACH

Common Ground does not presume to duplicate the funding associated with SR 37 capital improvements. Our Grand Bayway approach is to develop a regional identity for the open space to steer operational funding associated with the SR 37 transportation corridor for:

- Developing more multimodal transit opportunities (rail, bike, micro-transit etc.).
- Preserving and benefiting a more connected baylands that can thrive for the next 100 years with sea level rise.
- Public place-based education destinations along the “loop” of the region.

Resilient by Design Bay Area Challenge

Design Team Financing Plans

Design Team:

The Home Team

Project Area Focus:

North Richmond and San Pablo Bay

Finance Plan

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Bay Area RBD | Home Team Benefits Evaluation & Funding Alignment Approach

In close coordination with North Richmond community stakeholders, the Home Team has developed a series of initiatives, including investments in sea level rise adaptation, infrastructure and community-supportive programs, that respond to local needs and create new opportunities for local and regional residents and stakeholders. The initiatives that make up the ouR-HOME project address a series of environmental, social and physical vulnerabilities while also celebrating local context, elevating North Richmond's history and current community, tapping into existing opportunities within the community, and creating new opportunities to drive multiple local benefits.

Rather than utilizing the traditional value capture approach—which prioritizes the generation of new opportunities to investment and development, and captures the economic and fiscal benefits of increased value associated with these investments—the Mithun Home Team developed interventions that seek to stabilize the existing community, provide tools for local wealth building and catalyze locally-concentrated economic activity. Our approach to initiative development was shaped by a benefits assessment methodology that identifies and positions individual projects and initiatives to deliver community priorities and environmental, social and economic benefits. Taken together, the team's initiatives simultaneously prioritize physical resilience and goals around building health, wealth, and social cohesion in this community.

Benefits Evaluation & Funding Alignment

To articulate the benefits associated with the core projects and draw an alignment to the most promising funding sources, the Home Team followed the below process for each project:

- i. Evaluate specific **benefits** that may accrue to the community based on project implementation, considering ecological and environmental, social and economic benefits.
- ii. Assess potential **project champions and implementation partners** from local, regional and state organizations, governments and non-governmental actors, based on the alignment of their missions and goals, and interest and involvement in project development throughout the Resilient by Design process.
- iii. Compare and evaluate benefit types and project champions and partners with the most well-aligned public, private, and philanthropic **funding sources and financing tools**. Because each project initiative is a piece of the Home Team's full resilience strategy for North Richmond, the focus of ouR-HOME is not on near- and long-term actions but on a more comprehensive response to a wide array of local issues. In many cases, project elements are cumulative and will evolve over many years in both parallel and incremental steps. Therefore, funding alignment was evaluated for pre-development activities and implementation activities, rather than for near- versus long-term opportunities.

While the individual initiatives require further development to produce cost estimates and progress analysis of a potential funding stack, the attached Benefits Matrix illustrates the alignment between benefits, project champions and/or partners, and funding and financing alignment for each proposed project. An illustrative example, using the Home Team's "Filter" initiative, is described below.

Challenge

North Richmond suffers from rates of asthma higher than those anywhere else in the Bay Area. Meetings with local stakeholders and the North Richmond Community Advisory Board demonstrated the community priority of addressing public health concerns with the goal of decreasing local asthma rates and avoiding future healthcare costs to treat associated impacts of poor air quality.

Initiative Development

This led to development of Filter: 20,000 Trees of Justice, which seeks to plant 20,000 trees throughout underutilized and vacant lots in North Richmond, creating an “urban forest” and including associated green infrastructure improvements.

Benefits Evaluation

Based on the team’s assessment of this initiative, Filter is anticipated to produce the following benefits (for example):

—Ecological Benefits

- » Climate adaptation benefits, including stormwater management, and temperature moderation
- » Restoration of natural habitat through planting of local species

—Social Benefits

- » Reduced instance/rate of asthma and other ailments related to poor air quality
- » Increased access to nature/urban forest

—Economic Benefits

- » Future avoided costs associated with enhanced stormwater management capacity and temperature moderation
- » Future healthcare and social welfare cost savings

Potential Project Champions & Partners

In recognition of Chevron's historic role in degrading air quality and their more recent commitment to local philanthropy, the Home Team proposes that Chevron play an active role in funding Filter. Partially funding Filter would provide some of the capital costs needed for project initiative, while also off-setting some of the refinery’s cap-and-trade costs. Recognizing that this single source may not fulfill the full project cost need, the team recommends exploring the following additional funding and financing sources to support project predevelopment (including final planning and design) and implementation:

—Predevelopment Planning & Design

- » Local funding for infrastructure development (ex: Contra Costa County budget)
- » Philanthropic grants (ex: Trust for Public Land conservation funds, Chevron Corporate Responsibility grant)

—Implementation

- » Local funding for infrastructure development (ex: Contra Costa County budget)
- » State/local grant funding (ex: Grant of Measure AA funds, CA State Coastal Conservancy Climate Ready Grant)
- » Value Capture through Cap and Trade Auction Investments
- » State/local bond issuance (ex: Prop 1 State Water Bond, SB5 Resources and Climate bond)
- » Social impact bonds (may be tied to improved health conditions)
- » North Richmond Green Mitigation Fund (as proposed by Home Team)

This example is illustrative of the Home Team’s implementation and finance plan development process. The outcomes of this process for all projects is captured

FILTER: 20,000 TREES OF JUSTICE

Project Components	Anticipated Benefits	Project Champions/Partners	Potential Funding Alignments
Create an urban forest and natural air filter by planting 20,000 trees in streets, open spaces, and underutilized lots throughout North Richmond.	<p>Ecological Benefits</p> <ul style="list-style-type: none"> — Enhanced air quality — Climate adaptation benefits, including stormwater management, temperature moderation, and others — Restoration of natural habitat through planting of local species <p>Social Benefits</p> <ul style="list-style-type: none"> — Reduced instance/rate of asthma and other ailments related to poor air quality — Increased access to nature/urban forest <p>Economic Benefits</p> <ul style="list-style-type: none"> — Future avoided costs associated with enhanced stormwater management capacity, temperature moderation, and other ecological benefits — Future healthcare cost savings — Future social welfare cost savings 	<p>Local/Grassroots Organizations</p> <ul style="list-style-type: none"> — West County Toxics Coalition — Urban Tilth — The Watershed ProjectCommunities for a Better Environment — East Bay Parks District <p>Local Government</p> <ul style="list-style-type: none"> — North Richmond Municipal Advisory Council — City of Richmond Mayor's Office — Contra Costa County Supervisor John Gioia <p>Regional/State Government</p> <ul style="list-style-type: none"> — Contra Costa Flood Control District <p>Regional/State Non-Government</p> <ul style="list-style-type: none"> — Communities for a Better Environment — West County Wastewater Facility — SF Bay Restoration Authority 	<p>Predevelopment Planning & Design</p> <ul style="list-style-type: none"> — Local funding for infrastructure development (ex: Contra Costa County budget) — Philanthropic grants (ex: Trust for Public Land conservation funds, Chevron Corporate Responsibility grant) <p>Implementation</p> <ul style="list-style-type: none"> — Local funding for infrastructure development (ex: Contra Costa County budget) — State/local grant funding (ex: Grant of Measure AA funds, CA State Coastal Conservancy Climate Ready Grant) — Value Capture through Cap and Trade Auction Investments — State/local bond issuance (ex: Prop 1 State Water Bond, SB5 Resources and Climate bond) — Social impact bonds (may be tied to improved health conditions) — North Richmond Green Mitigation Fund (as proposed by Home Team)

THRIVE: HOME OWNERSHIP AND AFFORDABLE LIVING AS A PATH FOR COMMUNITY WEALTH BUILDING

Project Components	Anticipated Benefits	Project Champions/Partners	Potential Funding Alignments
<ul style="list-style-type: none"> — Social Impact Bond (SIB) — Establish a Community Land Trust (CLT) to manage programs for, and develop: <ul style="list-style-type: none"> • Small Lot Home Ownership • Multi-family Housing with Shared Amenities — Resilience Hub — Walk of Honor — Programs: <ul style="list-style-type: none"> • Local Hiring Requirement • Deep Green Energy and Water Systems • Electric Vehicles and Car Share 	<p>Ecological Benefits</p> <ul style="list-style-type: none"> — Reduced energy and water consumption — Reduced vehicular emissions <p>Social Benefits</p> <ul style="list-style-type: none"> — Increased opportunity for local homeownership and equity-building, strengthening community stability — Increased social cohesion developed through shared housing/homeownership programs and recognition of local history — Increased financial literacy and support for homeowners — Education and increased awareness of local resiliency challenges and adaptation measures <p>Economic Benefits</p> <ul style="list-style-type: none"> — Local job generation (through construction, program management, etc.) — Local spending and economic output associated with construction and program management activities — Use of underutilized land, and associated local and regional fiscal benefits 	<p>Local/Grassroots Organizations</p> <ul style="list-style-type: none"> — Marin County Energy — Urban Tilth — Las Deltas Task Force <p>Local Government</p> <ul style="list-style-type: none"> — Contra Costa County Supervisor John Gioia — City of Richmond Mayor's Office — Contra Costa Housing Authority <p>Regional/State Government</p> <ul style="list-style-type: none"> — Marin Clean Energy — California Housing Development Corporation — Contra Costa County 	<p>Predevelopment Planning & Design</p> <ul style="list-style-type: none"> — Future implementation partner/actor fundraising — Program-related investments (ex: Kresge Foundation grants and social investments) — Predevelopment loan (ex: SB540: Workforce Opportunity Zone) — Federal tax incentive programs (ex: Opportunity Zone Program) <p>Implementation (Development Initiatives)</p> <ul style="list-style-type: none"> — Low-income housing tax credits (LIHTC), depending on project affordability — Local affordable housing funding (ex: Home Investment Partnerships Program) — North Richmond Affordable Housing Social Impact Bond (proposed by Home Team) — Mission or program-related investments — Local fundraising for Heritage Walk (through CAB or another local champion) <p>Implementation (Program Initiatives)</p> <ul style="list-style-type: none"> — North Richmond Affordable Housing Social Impact Bond (proposed by Home Team) — Property Assessed Clean Energy (PACE) loans — Low Interest Loans (ex: CA Energy Commission Energy Efficiency Financing Program) — PG&E Electric Vehicles Charge Network Program

RELATE: WILDCAT CREEK TRAIL: AN UPLAND TO BAYLAND CONNECTOR

Project Components	Anticipated Benefits	Project Champions/Partners	Potential Funding Alignments
<p>A multi-use overpass to connect Wildcat Creek Trail and upland bay areas, providing a safe overpass of the Richmond Parkway.</p>	<p>Social Benefits</p> <ul style="list-style-type: none"> — Increased connectivity and cohesion between the upland and bayfront areas, and creation of new open space, within North Richmond — Increased safety and avoided loss of life — New opportunities for recreation and education, related to local ecology and history <p>Economic Benefits</p> <ul style="list-style-type: none"> — Local job generation (through construction, program management, etc.) — Local spending and economic output associated with construction and ongoing O&M 	<p>Local/Grassroots Organizations</p> <ul style="list-style-type: none"> — East Bay Parks District — Bay and Water Trails — The Watershed Project — Urban Tilth <p>Local Government</p> <ul style="list-style-type: none"> — City of Richmond Mayor's Office — Contra Costa County Supervisor John Gioia — North Richmond Municipal Advisory Council — Contra Costa Public Works Department <p>Regional/State Government</p> <ul style="list-style-type: none"> — Metropolitan Transit Council <p>Regional/State Non-Government</p> <ul style="list-style-type: none"> — The California Outdoor Engagement Coalition — The Coastal Conservancy — California Restoration Authority — SF Bay Restoration Authority 	<p>Predevelopment Planning & Design</p> <ul style="list-style-type: none"> — Local funding for infrastructure planning and development — State and local grants (ex: Grant of Measure AA funds) — Philanthropic grants (ex: Land and Water Conservation Fund grants, Active Transportation/ Safe Routes to School) <p>Implementation (Development Initiatives)</p> <ul style="list-style-type: none"> — Local funding for infrastructure development — Federal grant funding (ex: TIGER grants) — Local/regional grant funding (ex: MTC) — Value Capture through Cap and Trade Auction Investments, SB595 toll revenue — Green Mitigation Fund (as proposed by Home Team)

GREEN MITIGATION FUND: A TOOL FOR RESTORATIVE JUSTICE

Project Components	Anticipated Benefits	Project Champions/Partners	Potential Funding Alignments
<ul style="list-style-type: none"> — Green Mitigation Fund — Community Air Risk Evaluation Program — Community Infrastructure — Energy Grid Upgrade — Energy Storage — Decentralized Wastewater Pilot 	<p>Ecological Benefits</p> <ul style="list-style-type: none"> — Enhanced air quality — Climate adaptation benefits, including decreased emissions, cleaner energy production <p>Social Benefits</p> <ul style="list-style-type: none"> — Improved community health — Potential job training and local employment opportunities <p>Economic Benefits</p> <ul style="list-style-type: none"> — Future avoided costs associated with electrical grid reinforcement, increased energy storage efficiencies — Local spending and economic output associated with construction of new infrastructure — New funding sources for local climate mitigation projects 	<p>Local/Grassroots Organizations</p> <ul style="list-style-type: none"> — The Watershed Project — Urban Tilth <p>Local Government</p> <ul style="list-style-type: none"> — City of Richmond Mayor's Office — Contra Costa County Supervisor John Gioia — Contra Costa County Flood Control District — Contra Costa Department of Public Health — North Richmond Municipal Advisory Council <p>Regional/State Government</p> <ul style="list-style-type: none"> — Metropolitan Transit Council <p>Regional/State Non-Government</p> <ul style="list-style-type: none"> — Bay Area Air Quality Management District 	<p>Predevelopment Planning & Design</p> <ul style="list-style-type: none"> — Local funding for infrastructure planning & development — Philanthropic grants for program development <p>Implementation (Development Initiatives)</p> <ul style="list-style-type: none"> — Local funding for infrastructure development — Grant funding (ex: BAAQMD Air Quality Mitigation Funds, EPA Brownfield Remediation funding, AB617 Community Air Protection Program) — State/Local Bond Issuance (ex: Prop 1 State Water Bonds, Value Capture through Cap and Trade Auction Investments) — Retrofit Loans — North Richmond Green Mitigation Fund (proposed by Home Team), supported by: <ul style="list-style-type: none"> •Corporate investments/contributions •Grant funding •Local/regional impact fees

FLOW AND GROW: INNOVATIVE MULTI-BENEFIT FLOOD CONTROL

Project Components	Anticipated Benefits	Project Champions/Partners	Potential Funding Alignments
<p>A protective horizontal levee to protect critical infrastructure in the face of rising tides and storms while also providing new marshland acreage and a naturally occurring transition zone that combines flood control with a natural, low-energy way to provide tertiary treatment of wastewater.</p>	<p>Ecological Benefits</p> <ul style="list-style-type: none">— Climate adaptation benefits, including protection from rising tides and storm surges— Regeneration and protection of existing marshland habitat— An alternative to high-energy wastewater treatment <p>Social Benefits</p> <ul style="list-style-type: none">— Fortified protection of critical assets from rising tides and storm surges <p>Economic Benefits</p> <ul style="list-style-type: none">— Future avoided costs associated with sea level rise and storm surges	<p>Local/Grassroots Organizations</p> <ul style="list-style-type: none">— Ducks Unlimited— Urban Tilth— The Watershed Project— San Pablo-Wildcat Creek Watershed Council <p>Local Government</p> <ul style="list-style-type: none">— Contra Costa County Supervisor John Gioia— Contra Costa Flood Control District— City of Richmond Mayor's Office— North Richmond Municipal Advisory Committee <p>Regional/State Government</p> <ul style="list-style-type: none">— California State Coastal Conservancy— Senator Tony Thurmond— FEMA <p>Regional/State Non-Government</p> <ul style="list-style-type: none">— SF Bay Restoration Authority— West County Wastewater Facility	<p>Predevelopment Planning & Design</p> <ul style="list-style-type: none">— Local funding for infrastructure planning and development— State/local grant funding (ex: Grant of Measure AA funds)— Philanthropic grants <p>Implementation (Development Initiatives)</p> <ul style="list-style-type: none">— Federal funding (FEMA dollars for pump replacement)— State grants (ex: State Coastal Conservancy Grants)— Local/state bond issuance (ex: Prop 1 State Water Bonds, SB5 Resources and Climate bond)— Value Capture through Cap and Trade Auction Investments— Public-private partnership (with corporate participation in capital costs or ongoing O&M costs)— Catastrophe bonds and/or resilience bonds (depending on affected land ownership)

Governance and Regulatory Challenges and Opportunities

The Mithun Home Team project proposals were developed with broad participation by local stakeholders. The North Richmond Community Advisory Board (CAB) assembled to guide the design process was intentionally developed with a mix of representatives from different sectors, including Contra Costa County and the City of Richmond government, non-profit advocates, technical experts, business representatives and local residents. Given the process for generating design concepts, it is not surprising that the implementation plans envisioned are also leveraging collaborative governance models, engaging multiple layers of government together with community representatives and technical experts. Preliminary concepts exploring collaborative governance include the following:

Community Land Trust

The proposal to develop a community land trust (CLT) will require the development of new organizational structures that include public and private sector partners working together. The City of Richmond is interested in CLTs and will take the lead in exploring the legal structure that would support this, with Contra Costa County staff and community representatives participating as stakeholders. The city and county government representatives acknowledged that shared projects are not common, but that there is no history of difficulty working together. The parties are open to collaboration and see the benefit of greater partnership.

CLTs reflect a choice to stabilize the housing market in favor of slower, more predictable growth over dramatic swings in the market that create windfall profits for some and loss for others. While clear and equitable rules are needed to protect those that invest in housing

developed on CLT land, the structure also benefits from the social bonds in a community that cultivate trust and a sense of shared interest. City of Richmond representatives are eager to engage residents and ultimately transfer the control over the CLT process to a non-profit community-based board or coalition.

Social Impact Bond

Social impact bonds (SIB) are an investment product that brings together donors, impact investors and nonprofit organizations to fund socially beneficial projects in a completely new, performance-driven way. For example, SIBs provide investors an opportunity to fund a project by a non-profit housing developer, and earn a financial return based on “impact” measured against a set of established goals, such as affordability metrics and energy performance. Small local for-profit contractors could also be funded to build small lot infill housing depending on the performance criteria set. The governance challenge is complex because programs need to be clearly defined and conflicts of interest need to be avoided. However a benefit of community collaboration on the terms of the SIB is that the process itself would create benefits as more people would come to know about.

Transitioning Public Housing

North Richmond includes a public housing site called Las Deltas that is in the process of being decommissioned under a plan that will transfer 100% of the housing subsidy to units elsewhere in the county. After the transition is complete, housing will transfer either to private parties or to another supported affordable housing structure. There are provisions that enable residents to have first right of refusal for all sold properties, however they will need considerable funding to purchase even if the sale is subsidized.

Resilient by Design Bay Area Challenge

Design Team Financing Plans

Design Team:

All Bay Collective

Project Area Focus:

San Leandro Bay

5.1 Near-Term Finance Plan

Creek and Floodplain Restoration and Enhancements

Near-term improvement actions (e.g., East Slough channel capacity improvements, Arroyo Viejo to Elmhurst realignment) would cost on the order of \$50 million to \$100 million, including project costs and land acquisition. These improvements would deliver a variety of benefits, enabling them to compete for funding from current and future grant sources. These include:

- Proposition 68 Program Funds (assuming this ballot initiative passes in June)⁶
- San Francisco Bay Restoration Authority Measure AA (Oakland Priority Creeks and Trails have Priority Conservation Area designation)
- California State Parks Habitat Conservation Fund (for acquisition and development of wildlife corridors and trails)
- California Coastal Conservancy Climate Ready Program grants (from cap-and-trade program)
- California Fish and Wildlife Greenhouse Gas Reduction Program (for restoring wetlands and coastal watershed)
- Bay Area Council Foundation California Resilience Challenge grants (request for proposals anticipated in September 2018)
- Social and environmental impact bonds supported by a local joint powers authority
- Other federal, state, and foundation grant sources

Bicycle and Pedestrian Connectivity Improvements

A variety of existing sources could fund these near-term improvements (e.g., Bay Trail connection – High Street to Tidewater Boating Center, Hegenberger Greenway). These projects would deliver multiple of economic, environmental, and social co-benefits, making them very competitive in funding evaluation processes. Sources include:

- Metropolitan Transportation Commission (MTC) funds
- MTC One Bay Area Grant (priority development area within study area)
- Alameda County Measure BB
- Community Benefit District funds (were one to be formed)
- California State Parks Recreational Trails Program
- Active Transportation Program for new bike and pedestrian facilities (from cap-and-trade program)
- Affordable Housing and Sustainable Communities program (has local mobility component)
- Other federal, state, and foundation grant sources

Near-term projects (1-10 years) would be supported primarily through existing and proposed grant funding sources. These opportunities are typically funded and administered by public agencies, non-profits, and community-based organizations.

⁶<http://www.bca.gov/BallotAnalysis/Proposition?number=68&year=2018>

Resilient by Design Bay Area Challenge

Design Team Financing Plans

Design Team:

Public Sediment

Project Area Focus:

Alameda Creek

UNLOCK ALAMEDA CREEK

FINANCE PLAN : POTENTIAL GRANTS AND FUNDING SOURCES

	Name / Granting entity	source of funds	what it funds	why is it applicable to unlock Alameda Creek	Funding availability
	Measure AA Grants / SF Bay Restoration Authority	Measure AA funds	Bay Restoration	Measure AA is directly applicable to the full extent of Unlock Alameda Creek, as a primary goal of the project is supplying sustainable sediment feeds to existing and new baylands at Eden Landing restoration project nd the wider South Bay.	\$23 million a year for 20 years before automatically expiring in 2037
	Climate Ready: Nature-Based Solutions for Climate Adaption / California Coastal Conservancy	Climate Ready grants	Projects that use nature-based solutions to adapt to impacts of climate change. Special emphasis on pilots and on-the-ground projects. Projects must have greenhouse gas reductions embedded in the proposal. 75% of selected projects must fall within SB 535 disadvantaged community criteria.	Sediment supply to wetlands provides a nature-based mechanisms for sea level rise adaptation of bayland environments and the cushioning of their urban edges. Potential targets - Pebble Dune pilot or vegetative studies for Alameda Creek, Eden Landing and Dry Creek areas comply with disadvantaged community requirements for SB 535.	Grants due July 07 2018
	Coastal Conservancy Prop 1 funds	Prop. 1 - Water Bond (Assembly Bill 1471)	Funding from Prop 1 is intended to fund projects that provide more reliable water supplies, restore important species and habitat, and develop a more resilient and sustainably managed water system (water supply, water quality, flood protection, and environment) that can better withstand inevitable and unforeseen pressures in the coming decades.	Unlock Alameda Creek restore important species and habitat and develop a more resilient and sustainably managed water system (linking environment, water supply, and flood protection)	Solicitations due June 8th, 2018
	California Ocean Protection Council	Prop 84 and Prop 1 Competitive Grants program	Prop 1: Climate change adaptation, marine managed area protection, fisheries infrastructure and improvement of ocean water quality. Prop 84: Ocean acidification, sustainable fisheries and aquaculture, coastal sediment management, and marine pollution.	Apply directly to climate change adaptation and sediment management.	Proposals closed for the year. Potential to repeat- Prop 1 to have 9.3 million in funding available next year.
State & Local Grants	CA Department of Fish and Wildlife 155 M State appropriation	State appropriation	wetland projects that will be managed for 50+ yr benefits		\$15M
	Cap and Trade Funds	Assembly Bill 398	climate change mitigation and adaptation		\$28 / year
	Climate Adaptation And Resilience Program / Wildlife Conservation Board	Assembly Bill 109	60 of funds allocated to conservation easement acquisition. Remained used to develop and implement natural and working lands adaptation and resiliency planning and support	Unlock Alameda Creek aims to develop a resilient sediment supply framework for Eden Landing.	Preapplication deadline of May 18th 2018
	TEP - Transportation Expenditure Plan	Measure 88 Transportation Expenditure Plan	improve air quality and provide clean transportation by reducing pollution using innovative technology and expanding bike and pedestrian paths, and BART, bus and commuter rail expansion and operations.	Could apply to Bay Trail expansion and public access strategy (bridge) in Eden Landing	
	CA Prop 68	Pending	Proposition 68: This measure is a \$4.1-billion bond proposal, with most of the borrowed money going to drought, water, parks and coastal protection programs.	Unlock Alameda Creek has parks, water, and coastal protection benefits. Alignment with all aspects of the funding, including park and open space creation and preservation, climate adaptation, water resource management, and outdoor access for all.	Pending vote June 2018.
	Cal Trans Planning Grant Program	Cal Trans	Adaptation planning, Sustainable Communities Grants, Strategic Partnership grants, Transportation - centric.	Unlock Alameda Creek proposes enhancements to the Alameda Creek regional trail and Bay Trail.	closed by 2018, open in 2019.
	Acquisition funds	Conservancy acquisitions funds	The State Coastal Conservancy and other entities provide funding for land acquisition for public access and conservation at fair market value.		
Regional Grants	Bay Area WW Utilities + CA Water Control Board - pending	Pending	The State of California Water Quality Control Board is working with Bay Area wastewater utilities that discharge to the Bay to develop multi-benefit "green" projects as alternatives to traditional wastewater treatment.		

UNLOCK ALAMEDA CREEK

FINANCE PLAN: POTENTIAL GRANTS AND FUNDING SOURCES

	Name / Granting entity	source of funds	What it funds	Why is it applicable to unlock Alameda Creek	Funding availability
Federal Grants	Continuing Authorities Program (CAP)	USACE	The Corps' Continuing Authorities Program (CAP) is a group of nine legislative authorities under which the Corps of Engineers can plan, design, and implement certain types of water resources projects without additional project specific congressional authorization. The purpose of the CAP is to plan and implement projects of limited size, cost, scope and complexity. Levee and channel modifications are examples of flood control projects constructed utilizing the Section 205 authority.	Unlock Alameda creek proposes changes to levee and channel modifications.	
	SF Water Quality Improvement Fund	EPA	The EPA manages a competitive grant program to support projects to protect and restore San Francisco Bay.	Unlock Alameda Creek proposes fluvial and tidal wetland restoration.	EPA selected four proposals totaling 4.3 million in funding in 2017. This year's applications are closed.
	NOAA Coastal Resilience Grants	NOAA	This competitive grant program funds projects that are helping coastal communities and ecosystems prepare for and recover from extreme weather events, climate hazards, and changing ocean conditions.	Unlock Alameda Creek is a coastal resilience project.	NOAA will not award Coastal Resilience Grants in 2018, but a new competitive grant opportunity will be available later this year. With the passage of the Consolidated Appropriations Act (2018), Congress appropriated \$30 million to strengthen coastal communities and protect, conserve, and restore ocean and coastal resources and coastal infrastructure. The National Fish and Wildlife Foundation will administer this funding and establish a new grants program in partnership with NOAA, as authorized under the National Oceans and Coastal Security Act.

Resilient by Design Bay Area Challenge

Design Team Financing Plans

Design Team:

Field Operations

Project Area Focus:

South Bay Sponge

SOURCES OF FUNDING

While a variety of existing sources of local, state, and federal funding may support the implementation of the South Bay Sponge, the 20-mile project will be dependent on a portfolio of multiple-funding sources. Given the scale and estimated costs of the framework components, all existing sources of funding, even when combined, fall short of what is necessary to protect vulnerable areas. Moreover, the availability of some of our identified sources of funding is uncertain in the future.

Existing sources of funding are more likely to support further project planning and feasibility assessment in the short-term to either establish a more detailed and implementable project strategy or to identify further sources of capital funding.

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That said, local funding sources are the most viable component of a funding portfolio for implementing resiliency projects in the South Bay. Projects in Santa Clara will benefit from both the Water District and its parcel-tax funded mandate to provide flood protection for the county, as well as the high potential for public-private partnerships with Silicon Valley firms. These advantages, however, will not address projects in neighboring San Mateo County, or ensure that sufficient funding is available for all projects or all communities.

An ‘all of the above’ approach to building a funding portfolio will be necessary, and this complex portfolio will then require significant levels of cooperation between jurisdictions to ensure cohesive decision-making, regional coordination, and interdependence.

An 'All of the Above' Funding Portfolio

The South Bay Sponge would require a portfolio of funding strategies combining local, state, and federal government sources along with public-private partnerships and foundations

Local Funding	+	State Funding	+	Federal Funding
Measure AA		Proposition 1		Environmental Protection Agency
Special Districts: Santa Clara Valley Water District San Mateo County Flood District		Proposition 68 (<i>June Ballot</i>) Senate Bill 1 Cap and Trade		Army Corp of Engineers Fish and Wildlife Service
Parcel Taxes		California Transportation Commission State General Funding		National Oceanographic and Atmospheric Agency
Development Impact Fees paired with TODs & Density Incentives				
Local Sales Tax				
Special Tolls on Transportation				
Utilities Rates and Charges				
Public-Private Partnerships				
Foundations				

South Bay Sponge Funding: Local

Local funding sources are the most viable component of a funding portfolio.

SOURCE/STRATEGY	ELIGIBILITY CRITERIA	VALUE (\$)
MEASURE AA	Regional, 9-county parcel tax of \$12/ year to fund wetlands restoration	\$500 M total over 20 years, \$25 M annual allocation, \$150,000 to \$6.2 M range for FY2017
SPECIAL DISTRICTS: SANTA CLARA VALLEY WATER DISTRICT	Strategy to fund specific flood protection initiatives across the county	Annual budget depends on district boundaries & taxation structure
PARCEL TAXES	Flat tax that does not vary according to the assessed value of the property	Annual revenue varies by district size
170 SPECIAL TOLLS ON TRANSPORTATION	Used to finance regional transportation capital improvements	Determined by rate increase
UTILITIES RATES AND CHARGES	Proposition 218 allows water and sewer utilities in California to increase rates to fund resilient infrastructure spending	Determined by rate increase
PUBLIC-PRIVATE PARTNERSHIPS	The number of Silicon Valley businesses at risk with SLR suggests partnerships are inevitable. Google & Facebook are sponsoring forms of resiliency studies in the region.	Case-by-case
FOUNDATIONS	Silicon Valley Community Foundation, Packard Foundation, and Hewlett Foundation are a few South Bay foundations supporting Climate Change initiatives	Case-by-case

RELEVANT RESTRICTIONS	RELEVANT PROJECT	RELEVANT JURISDICTION	LIKELIHOOD
Will not consider gray or hard infrastructure projects	Saltwater Sponge / Horizontal Levee Freshwater Sponge Creeks / Micro-deltas	All	✓
Requires multi-jurisdiction coordination and cooperation	Shoreline Levee / Horizontal Levee Freshwater Sponge / Saltwater Sponge Creeks / Micro-deltas	All	✓
Maximum geographic scale of implementation is the county	All	All	?
Generally requires buy-in of voters in the entire San Francisco Bay region	Transit Infrastructure Improvements	All	?
Can only be used to fund projects that will have a direct benefit for water supply infrastructure	Freshwater Sponge Shoreline Levee / Horizontal Levee Creeks	All	?
Case-by-case	All	All	✓
Case-by-case	All	All	?

South Bay Sponge Funding: State

Current State Funds are either spent down, on the ballot this June or discretionary from year to year. Prop 68 and Senate Bill 1 are potential sources if they make it through the June Ballot.

SOURCE/STRATEGY	ELIGIBILITY CRITERIA	VALUE (\$)
PROPOSITION 1	Ecosystem and watershed protection, surface and groundwater storage, and water supply infrastructure	\$7.54 B allocated, \$6.62 B committed, \$928,362,000 remaining
PROPOSITION 1E	Rebuild and repair vulnerable flood control structures	\$4.09 B allocated, \$4.05 B committed, \$33,978 remaining
PROPOSITION 68 (JUNE BALLOT)	Funds for the development, restoration & acquisition of parks, as well as for resource conservation programs	\$4.0 B, if approved by voters
PROPOSITION 84	Water quality & supply, flood control, waterway & resource protection, state & local park improvements	\$5.39 B allocated, \$5.26 B committed, \$128,554 remaining
SENATE BILL 1 (JUNE BALLOT)	Repairs and upgrades to transportation infrastructure to build a more sustainable future network	\$5.4 B annual budget funded by a statewide gas tax
CAP AND TRADE	Auction revenue prioritizes urban greening, climate adaptation & resiliency projects	\$2.0 B annual budget funded by GHG emissions market
CALIFORNIA TRANSPORTATION COMMISSION	Increase use of active modes of transportation, such as biking and walking	\$1.5 M annual budget for the Active Transportation Program (ATP)
STATE GENERAL FUND	State appropriation funds many California agency grant programs	Ranges from \$2.0 M to \$15+ M, depending on the agency and the year

RELEVANT RESTRICTIONS	RELEVANT PROJECT	RELEVANT JURISDICTION	LIKELIHOOD
Most of the fund has already been spent down	Freshwater Sponge Shoreline Levee / Horizontal Levee Creeks / Micro-deltas	All	
Most of the fund has already been spent down	Shoreline Levee / Horizontal Levee	All	
Measure reallocates unissued bonds approved via Proposition 1, 1E and 84	Freshwater Sponge Shoreline Levee / Horizontal Levee	All	
Most of the fund has already been spent down	Freshwater Sponge Shoreline Levee / Horizontal Levee Creeks/ Micro-deltas	All	
Funds climate adaptation planning to protect investments in transportation projects, but does not fund implementation	Shoreline Levee / Transit Infrastructure Improvements	All	
Funds grant programs that vary in scope and scale by agency	Freshwater Sponge Shoreline Levee / Horizontal Levee Creeks / Micro-deltas	All, with priority to disadvantaged communities	
N/A	Trails / Bikeways Shoreline Levee	All	
Grant requirements vary by agency	All	All	

South Bay Sponge Funding: Federal

Current Federal Funds and Grants are limited in value, so are an unreliable source for capital projects in South Bay.

SOURCE/STRATEGY	ELIGIBILITY CRITERIA	VALUE (\$)
EPA SAN FRANCISCO BAY WATER QUALITY IMPROVEMENT FUND	Emphasis on technically sound projects to restore wetlands and watersheds, and to reduce polluted runoff	\$5 M annually
USACE CONTINUING AUTHORITY PROGRAM	Only granted for projects of limited scope and complexity; may be appropriate to fund a discrete phase that is part of a larger design; often implemented in sites of immediate risk	\$10 M cap per project
USACE PRE-DEVELOPMENT GRANT	Funding for planning/pre-development stages of Army Corp regulated project	\$100,000 maximum
FISH + WILDLIFE WILDLIFE RESTORATION GRANT	Funding for the selection, restoration, rehabilitation, and improvement of wildlife habitat, wildlife management research, and the distribution of information produced by the projects	\$5 M annually
NOAA COASTAL RESILIENCE GRANT	Two focus areas: strengthening the resilience of coastal communities and habitat restoration	Up to \$2 M per proposal, funding dependent on annual appropriations

RELEVANT RESTRICTIONS	RELEVANT PROJECT	RELEVANT JURISDICTION	LIKELIHOOD
Would require a government partner agency	Freshwater Sponge Saltwater Sponge / Horizontal Levee Creeks / Micro-deltas	All	
Would require a government partner agency	Freshwater Levee, discrete project area	All	
Would require a government partner agency	Freshwater Levee, design development	All	
Would require a government partner agency	Freshwater Sponge Saltwater Sponge / Horizontal Levee Creeks / Micro-deltas	All	
FY2018 pre-proposal deadline has passed, would require a government partner agency	Freshwater Sponge Horizontal Levee	All	

Resilient by Design Bay Area Challenge

Design Team Financing Plans

Design Team:

Hassell+

Project Area Focus:

South San Francisco

2.3 FINANCE PLAN

OUR FINANCIAL APPROACH RELIES ON A NUMBER OF DIFFERENT PUBLIC AND PRIVATE FUNDING SOURCES.

Funding for the pre-development and development of our proposed projects will need to come from a variety of sources over a variety of time frames. We present here our guiding principles for funding and highlight mechanisms that should be focused on first or that present newer, innovative sources of funding. Specific cost estimates and phasing are discussed in the individual project proposals.

Three principles guide our plan for securing funding for the projects in our design proposal, and point to the combination of funding sources that sponsors will need to consider for each project.

Leverage internal value

Leverage local flood insurance payments, property assessments and increases in land value to the extent feasible to finance resilience improvements. We estimate that the maximum value of a 50-year bond based on a special assessment or tax on properties either protected along the shoreline or benefited by the Colma Creek improvements would be approximately \$165 million in present dollars. This is based on multiplying the current assessed value by 0.5% (which is a high assessment) and the underlying annual revenue.

Better position for outside funding

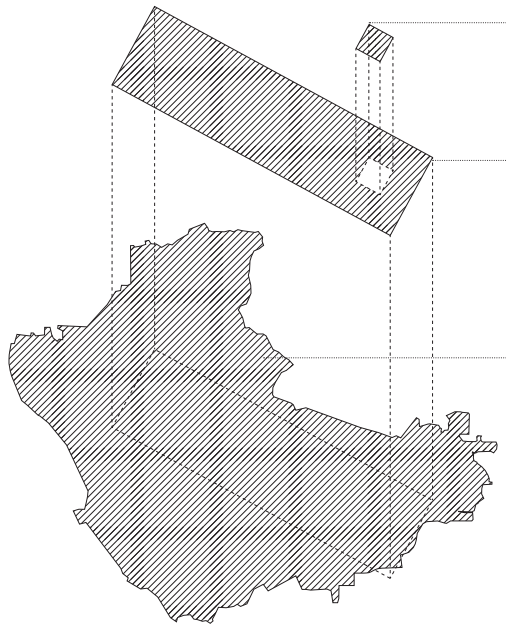
Make the most of outside funding and grant sources from regional, state and federal sources and philanthropy. The grant sources table in Part 4 - Project Delivery Sheets provides details on potential grant funding opportunities.

Align with asset owners

Influence the design of resilience investments made by large infrastructure asset owners (including Caltrans, and SFO and water treatment plant).

This combined approach will diversify the risks associated with each type of funding, and will better enable the City of South San Francisco and other project sponsors to make the case for the multiple benefits associated with each project. Part 4 provides detailed information on each type of funding source.





PROJECT: Individual projects could be awarded density bonuses for incorporating resilient design that provides community benefit beyond what is required.

DISTRICT: Properties benefiting from resilient or urban greening improvements could help fund them through Community Resiliency Facilities Districts based on pooled insurance premiums, traditional Community Facilities Districts, Geological Abatement Hazard Districts, and other special taxes.

CITYWIDE: An increased citywide parks assessment for new park construction as well as improvements to existing parks' operations and maintenance. The additional assessment could be justified in part by demonstrating that existing parks would be improved in part by connecting them to the new parks through the Colma Creek trail and access to the shoreline.

REGIONAL/STATEWIDE: Regional and state grants would help fund investments, such as watershed and stormwater improvements, with ramifications beyond the City of South San Francisco. Additional funding could come from aligning the investments of regional/state asset owners such as Caltrans, San Francisco International Airport and the Water Quality Control Plant with the projects in this design proposal.

First Steps

Where should the City of San Francisco and other potential project sponsors and champions start? We suggest the following action plan:



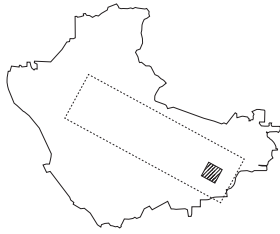
2.3 FINANCE PLAN - FUNDING INNOVATIONS

A SUCCESSFUL FUNDING STRATEGY WILL COMBINE TRIED-AND-TRUE METHODS WITH NEWER APPROACHES

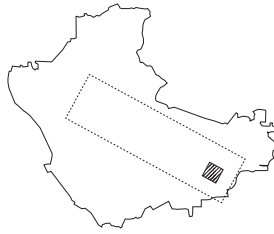
Below we discuss five innovative funding mechanisms that can help bring South San Francisco closer to its resiliency funding goals.



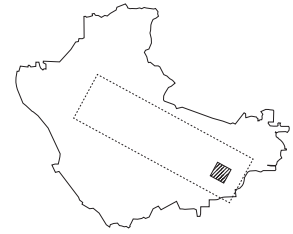
Funding mechanism	Community Resiliency Facilities District	In Lieu Fee Mitigation and Managed Retreat Finance Policies
Scale	District	District
Purpose	Finance District level SLR and Flooding Infrastructure Investments	Finance manage retreat through densification/development
What it could fund	Lower Creek Restoration & Public Access SLR 'Living Levee' & Wetland Collector	SLR 'Living Levee' & Wetland Collector
What it is	Property owners in a FEMA flood zone join together to fund resiliency improvements through lower insurance premiums.	Potential upzoning in certain developments in exchange for buyout assistance toward the buyout and managed retreat of chronically flooded areas.
How it could fund proposed resiliency project in South San Francisco	Property owners currently participating in the National Flood Insurance Program would instead purchase flood insurance from a Community Choice Flood Risk Financing pool. Payments above the cost of insurance but below the cost of FEMA insurance would go to resilient infrastructure.	Developers in the surrounding areas would receive density bonuses in exchange for contributing toward a buyout fund. Property owners (residential or commercial) in chronically flooded areas would have the choice of selling their property to the fund. The fund could further fund the retirement of existing building and restoration of wetlands in flooded zones.
Stakeholders who will benefit	Landowners within the district	Landowners in chronically flooded areas.
Already used in South San Francisco?	New	New
Process required for adoption	If structured as a CFD, 2/3 of property owners must approve	State legislature and/or City Council Approval.
Example	San Francisquito Creek JPA	New Jersey Blue Acres Program



Environmental Performance Bonds



Green Bonds



Public-Private Partnerships

Project	Project	Project
Finance environmental infrastructure paid entirely through the performance of the asset	Finance infrastructure investments that also provide environmental benefits	Finance infrastructure investments that provide ongoing annual revenue after completion.
WQCP Upgrades & Eco Water Park SLR 'Living Levee' & Wetland Collector	The Circle Lower Creek Restoration & Public Access WQCP Upgrades & Eco Water Park SLR 'Living Levee' & Wetland Collector Watershed level projects	WQCP Upgrades & Eco Water Park
A bond issued by a municipal agency, utility, transit authority. Bond proceeds go to the issuer in case of a natural disaster.	A bond issued by a private company or public entity designed to fund environmentally beneficial initiatives.	A partnership between a public entity and private investor aimed at the construction of public infrastructure.
Flood prevention infrastructure would reduce insurance premiums for landowners, municipal agencies and transit authorities. A performance bond would bundle up those savings into an investment of infrastructure that prevents flood damage.	A bond issued by a municipal agency, utility, transit authority. Bond proceeds go to the issuer in case of a natural disaster.	A long-term investor, developer or operator of resiliency infrastructure would build, finance and potentially operate an infrastructure project. Investment entity would profit from future bond proceeds, future tolls or a combination of both.
Residents protected by resiliency infrastructure.	Residents protected by resiliency infrastructure.	Residents protected by resiliency infrastructure.
New	New	New
Ballot Measure	Ballot Measure/Board Approval	Request for proposal process and City Council Approval.
Texas Wind insurance Association	Apple's \$1.5 Billion Green Bond	Ontario Place Disraeli Bridges Winnipeg

Resilient by Design Bay Area Challenge

Design Team Financing Plans

Design Team:

BIG+ONE+Sherwood

Project Area Focus:

Islais Creek in San Francisco

GOVERNANCE AND FUNDING STRATEGY

The Islais Creek Basin is home to critical industrial and infrastructure functions and is bordered by the Bayview-Hunters Point, Potrero, and Dogpatch communities, each with a complicated history of a disconnection between planning and investment. This incongruence has left the area at best disconnected from the same levels of valuation, transportation connectivity, and attention from planners and city programs. At worst, this disconnection between planning and investment has driven a series of broken promises that have led to classic environmental justice scenarios, including the siting of the Southeast Wastewater Treatment Plant, lack of connected transportation, lack of greenspace and waterfront access, and zoning limited strictly to Production, Distribution, and Repair (PDR) businesses. Compounding these now structural challenges are climate-related risks of increased flooding, sea level rise, and liquefaction, alongside manmade risks like gentrification, uncertain affordability, and stress on the housing market.

In order for our design proposal to adequately address this history, current reality, and foreseeable future risks, we co-created a plan of action from the bottom up. By firmly rooting a collaborative design process in the Islais Creek community, we have been

able to organically iterate with people who live, stay, and play in the area and reflect up-to-date community realities and desires with city bodies. This community driven design process has been well received in both the community and government spheres, proving a mutually beneficial process to quickly charrette ideas and limitations with these at times disconnected groups. Most promising, we have discovered that this honest style of design has really aided intergovernmental bodies and regulatory agencies to quickly familiarize, galvanize, and deputize City and Regulatory officials in support of this project.

RBD DESIGN PHASE APPROACH: BRIDGING CITY AND COMMUNITY

Our framework of community driven conversations and design are inherent for a holistic design process. Similar to the approach taken with the Islais Creek community - whereby we brought together disparate groups in order to facilitate an interdisciplinary discussion with multiple benefit design outcomes - we have strived during the design phase to bridge connection and conversation between traditionally siloed intergovernmental bodies. The direct City stakeholders that our project would affect are the Port of San Francisco, the San

San Francisco Public Utilities Commission (PUC), the San Francisco Department of Public Works (DPW), San Francisco Municipal Transportation Agency (SFMTA), and other public entities; and by extension the San Francisco Planning Department and the Office of Capital Planning. These bodies regularly interact on cyclical and oftentimes reactionary bases, but rarely if ever on occasion of planning for resilient, community-directed project planning, complete with funding schemes, champions, and proof of concept pilots. This is what the RBD process has afforded our team: the opportunity to gather together these intergovernmental bodies for a community-informed conversation on pre-emptive planning with realistic and achievable pilot projects and champions identified.

For the entirety of our project, we sought out and brought on leaders from the Port, Planning, and Capital Planning to act as close advisors at every stage of design and community engagement. This city working group has enabled us not only to test out our most wild and aspirational ideas with knowledgeable and seasoned perspectives, but has opened doors for our design team to continue to grow the web of influence and briefings. Our

design updates have become a recurring agenda item at the San Francisco Mayoral Task Force on Sea Level Rise - a group that brings together City leaders from a diverse set of departments to problem solve for sea level rise across departments and foci. We have solicited and incorporated feedback from technical advisors at mid, senior, and executive levels of the PUC, DPW, Port, and City Administrator, ensuring that governing bodies have a chance to share critical concerns ahead of our final design proposal. Through a deep city advisory and involvement program, we are ensuring that connectivity and a city-advised design are inherent in the design as it has been developed.

In tandem with our effort to incorporate and integrate intergovernmental perspectives into the design process, we understand that elected officials are a fundamental channel for the voice of the communities that we are working with. Therefore, we have taken a similar approach to integrate the viewpoints of San Francisco's representatives (and their constituents) at various levels of government. By taking a watershed approach to defining our project area, San Francisco's District 9 and District 10 Supervisors districts are central to the conversation. These

Supervisors have deep rooted connections to the communities we are working with, in addition to being able to serve as a conduit from residents to the San Francisco Mayor's office and beyond. We have held multiple briefing and feedback sessions not only with the Supervisors' offices for District 9 and District 10, but also with several of the top campaigning candidates for the District 10 seat that is up for re-election this year. Beyond the positive feedback, we believe that this approach is the best way for our project to be best broadcast to the thousands of residents that we simply could not hope to reach during the RBD process, in addition to the weaving of this project into the platforms of these important elected officials. .

It is this attention to the community, to the intergovernmental stakeholders, and to San Francisco's political future that we are recommending the following governance structure and funding and financing approach.

EMERGING FUTURE GOVERNANCE STRUCTURE: THE ISLAIS CREEK AUTHORITY (ICA)

Our approach during the design phase has helped set up a robust structure for the next phase of this project. Our team has identified five funding and financing principles that can best be delivered by a single entity which is empowered to marshal multiple resources and direct these resources towards a unified purpose across an extended time span and by delivering multiple projects. We propose establishing a new entity: the Islais Creek Authority (ICA) based on the many joint powers authorities already operating in the Bay Area, including the Transbay Joint Powers Authority which was formed in 2001 to deliver a new Transbay Transit Terminal in San Francisco; and using the Place Made model established by SF Made to deliver mission driven projects by combining market-based tools with other funding sources.

The ICA's key members could include the City of San Francisco Public Utilities Commission, the Port of San Francisco, the San Francisco Planning Department, and potentially, the Peninsula Corridor Joint Powers Board, the California Department of Transportation (CalTrans) and other state agencies. Except for the Planning Department, all of these agencies own essential assets in the area and will require long-term investments to protect these facilities from the increasing threats associated with flooding and sea level rise, including increased vulnerability to liquefaction and major damage from seismic hazard.

Establishing a single entity to manage and implement the long-term vision for the Islais Creek watershed will accomplish multiple objectives:

- Create a single entity to direct implementation projects and ensure that 20 to 30 years from now, the sum is greater than the whole of its parts;
- Allows for a single fiscal agent who can apply for and manage grant funding directed to project implementation as funds from these sources become available;
- Establishes a bonding authority that can incur debt and therefore deliver large-scale projects;
- Can assemble land on behalf of member entities;
- Can maximize the value capture potential created by acquiring and managing land for multiple purposes, including flood control and intensification;
- Can access capital at lower interest rates than the private sector;
- Can carry out necessary predevelopment activities including but not limited to research and development related to project delivery;
- Manage and leverage risk through life-cycle costing, and balanced risk sharing;
- Sustain ongoing community input and maintain ongoing project transparency.

Although this proposed governance structure suggests initial participation from at least four key public entities, three of whom are accountable to San Francisco's Mayor under the City's Charter, ICA members could be expanded over time as other potential partners are identified, such as the San Francisco Department of Recreation and Parks, the San Francisco Office of Community Investment and Infrastructure, the San Francisco Department of Public Works, and/or the San Francisco Municipal Transportation Agency.

In addition, there should be a policy or advisory committee that represents community stakeholder interests to ensure that even as projects are being identified, designed, and funded, that every project delivers the triple bottom line promise. Additionally, this framework will help projects, like parks without dedicated revenue streams get funded in a timely manner; rather than the more common outcome where community facilities are only delivered as the last phase of a redevelopment process because only then do value capture funds reach sufficient levels as to be able to pay for these improvements.

The Planning Department would be tasked, at least in the initial years or “start-up” phase as the lead agency, responsible for convening regular meetings, holding members accountable, and managing the staff necessary to take projects from vision to execution. These responsibilities line up well with the Planning Department’s responsibility for leading strategic long-range planning in San Francisco. However, over time, it is likely that the ICA will have its own staff, including an Executive Director, much like the Transbay JPA.

One key role that the ICA will need to perform is to purchase and hold properties using a buyout mechanism. To some extent, the SFPUC is already positioned to buy out properties that are subject to increasing flooding and where it is cheaper to buy out properties and allow them to flood, rather than to pay for cleanup following every major flood or SLR event.

However, unlike other “retreat” scenarios where property acquired to manage and contain flood waters are typically left as some form of open space when not needed for flood retention, it is possible that over time, PDR and residential buildings could be designed and built over or adjacent to the flood prone areas. These more intensive buildings would allow San Francisco to both protect and grow two critical assets: PDR businesses and affordable housing.

In today’s market, this approach seems infeasible in that multi-story PDR buildings are not well suited for all types of PDR businesses; and affordable housing requires deep subsidies to build, even without potential increases in construction costs necessary to make buildings flood resistant. But, with a significant land resource and the necessary policy framework, the ICA would have the ability to test and experiment with multiple models for delivering the desired housing and commercial space working with, but not fully relying on the private sector.

Resilient by Design Bay Area Challenge

Design Team Financing Plans

Design Team:

Permaculture

Project Area Focus:

Marin City

Marin City People's Plan

Finance Plan and Regulatory Strategy

Implementation of the People's Plan for Marin City involves resourcing both the continued articulation of the People's Plan through continued training and support as well as financing the near-term priority projects. For next steps in taking the preliminary People's Plan projects and developing them into biddable specifications (especially for those projects on public land) we have identified potential sources from regional, state and regulatory body (e.g., EPA, Coastal Conservancy, FEMA) grant programs and private or community philanthropy. P+SET is working with Shore Up Marin to approach potential funders including the Marin Community Foundation and the Flood Control District 3 who have indicated that funds may be available for continued community development of the Plan and implementation of priority pilot projects (as showcase models for future replication).

For implementation of certain projects or certain aspects of the decentralized green infrastructure development on private land we worked with the community to identify these potential sources of reimbursement grants for costs of implementation:

Community Block Grants

<https://www.marincounty.org/depts/cd/divisions/federal-grants>

Community Service Grants

<https://www.marincounty.org/depts/ad/service-fund-program-information>

Marin Municipal Water District - Cash for Grass or Turf Replacement rebates

<https://marinwater.org/163/Rebates>

<http://saveourwaterrebates.com/turf-replacement-rebates.htm>

Both Shore Up Marin and individuals in the community are pursuing financing to implement the shovel-ready strategies on private property and where site control is established.

Marin City People's Plan

The size, scale and nature of these small solution implementations is highly variable. Using meta study analysis of North American and local region implementation of bioretention features a conservative estimate of \$20 per square foot can be used as a proxy to estimate preliminary costs before biddable specifications are developed. P+SET will support Shore Up Marin with resources and materials to apply for grants from the following sources:

- Marin Community Foundation
- San Francisco Foundation (Rapid Response for Movement Building)
- FEMA
- Flood Control District 3
- CA DFW
- California Natural Resources Agency
- San Francisco Bay Restoration Authority
- State of California Coastal Conservancy - Climate Ready Program
- Kickstarter type campaigns

Where the community identifies bigger infrastructure improvements are needed we will implement additional training to map jurisdictions and understand both the limitations and potentials for blending capital across precincts and over time including novel forms of impact investing that the community could advocate for long-term, large scale improvements (that are informed by and harmonized with the People's Plan).

NEXT STEPS

Moving forward, our team will continue to partner with Shore Up Marin over the following summer months to do the following:

- Support Shore Up Marin in their ongoing organizational fundraising process. As is the case with many impactful organizations, Shore Up will benefit from consistent dedicated funding to support operational and development costs. Our team is meeting with Shore Up Marin and two foundations to begin the process of raising these funds.
- Request remaining funds from original RbD grant to fund:
 - Immediate hiring of a grant writer to apply for grants due within 90 days from the end of the RbD process. Longer term development and grant writing support can be funded by additional funds raised as part of the above mentioned fundraising process.
 - Continuation of the "Designing Our Own Solutions" capacity building training over the summer months. This training will focus on next steps for the build out of the "Marin City Intergenerational Garden" which is a central component of the proposed resiliency hub. More than half of the graduates of the first course are excited to take part in the ongoing training, and we are currently designing the specifics of the summer course

Resilient by Design Bay Area Challenge

Design Team Financing Plans

Design Team:

Bionic

Project Area Focus:

San Rafael

FUNDING & FINANCE MECHANISMS

Financing Framework

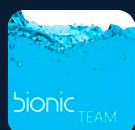
Given the regulatory and funding processes in California, it will be important for the San Rafael Canal Area to be embodied in a planning document that is sponsored by the governing jurisdiction.

One possible tool that could be very effective is a General Plan update through 2040. The city is currently updating the General plan. The plan update is ongoing and will be completed by 2020. **It is recommended that the resiliency planning will be incorporated in the ongoing General Plan update, and the General Plan update incorporate the data and analysis prepared as part of this challenge.**

Another tool for the city is to prepare Specific Plans for the Canal Area to provide detailed guidelines for future developments. Specific Plans could be prepared in conjunction with the General Plan 2040 preparation.

Traditional funding sources do not specifically target sea level rise resiliency systems and projects. Resiliency projects do, however, overlap with many traditional needs, such as improving transportation systems. As a result, many existing funding programs can potentially be layered to fund resiliency programs and projects.

Rising sea levels will have impacts throughout the Bay Area and will require costly solutions. As a result, it is envisioned that new regional public funding sources will be needed and developed to specifically fund resiliency systems. Examples of potential new sources might include a market system for incentivizing the dedication of land to wetlands or the Bay, a regional bond issue for sea level rise improvements, or the dedication of State matching funds for improvements.



assessment districts			
community facility district (CFD)		●	
development impact fees		●	●
developer credits and reimbursements		●	
development agreements and enhanced entitlements		●	●
economic incentive agreements		●	
development standards			
CEQA mitigations		●	
user and enterprise fees		●	
general fund	●	●	
capital improvement plan (CIP)		●	
tax increment financing (CRIA or EIFD)		●	●
cap and trade funds, one bay area grant program, TAP program	●		●
measure AA parcel tax			
Marin community foundation grants	●		●
infill infrastructure grant program			●
SB 2 funds			●
clean water state revolving fund		●	
state infrastructure bank		●	
community infrastructure program (SCIP)		●	
future regional sea level rise resiliency funding			
army core of engineers (ACOE)			
EPA grant	●		

Existing Potential Funding Sources

A spectrum of potential funding sources and mechanisms exist for implementing projects proposed for San Rafael, as shown in Table 2. This section describes the sources, mechanisms, and potential uses.

Although the terms “funding” and “financing” are often used interchangeably, there is an important distinction between the two terms.

“Funding” typically refers to a revenue source such as a tax, fee, or grant that is used to pay for an improvement. Some funding sources, such as impact fees, are one-time payments, while others, such as assessments, are ongoing payments.

“Financing” involves borrowing against future revenues by issuing bonds or other debt instruments that are paid back over time through taxes or fee payments, enabling agencies to pay for infrastructure before the revenue to cover the full cost of the infrastructure

FUNDING & FINANCE MECHANISMS

We propose a model using existing funding and finance mechanisms to prioritize new housing and neighborhood preference for existing residents, upgrades to existing housing and businesses, and upgrades to public infrastructure in the near term. The long term will require a new model for funding and financing large scale resilience.

Elevate San Rafael envisions a multi-pronged approach that creates surge housing and new housing on a large underutilized site adjacent to the existing neighborhood for current residents to occupy while existing housing is retrofitted and upgraded to floodable typologies. A Community Finance District (CFD) would be employed at a neighborhood or city scale to issue retrofit grants and low interest financing to support the housing and business upgrade program, along with near term public infrastructure projects that protect San Rafael in the near term. A Tax Increment Finance (TIF) or Enhanced Infrastructure Finance District (EIFD) would also support

public infrastructure improvements. Paired with an agreement with the city to master lease units, the City could ensure a stable supply of surge housing for current residents while their homes are upgraded, and a neighborhood preference program to prioritize first right of return to their homes.

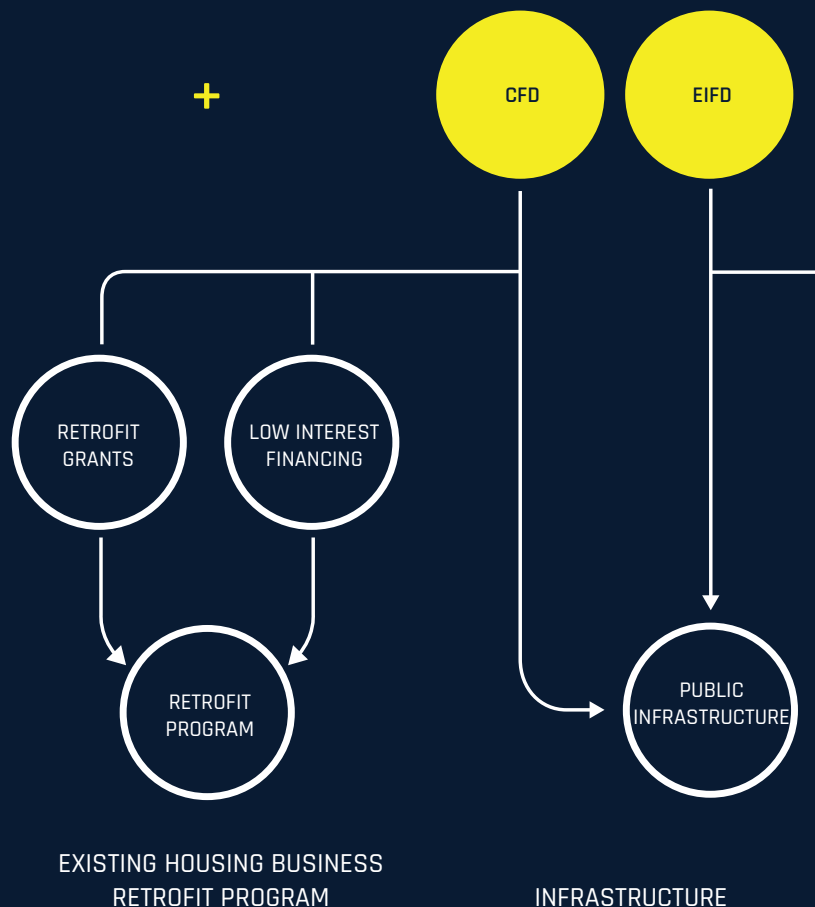
Given the community disenfranchisement that has historically resulted from Urban Renewal-style projects, we believe this more nuanced approach is critical.

The following outlines supply and demand-side subsidies to support residents in this process.

NOW



TIMELINE



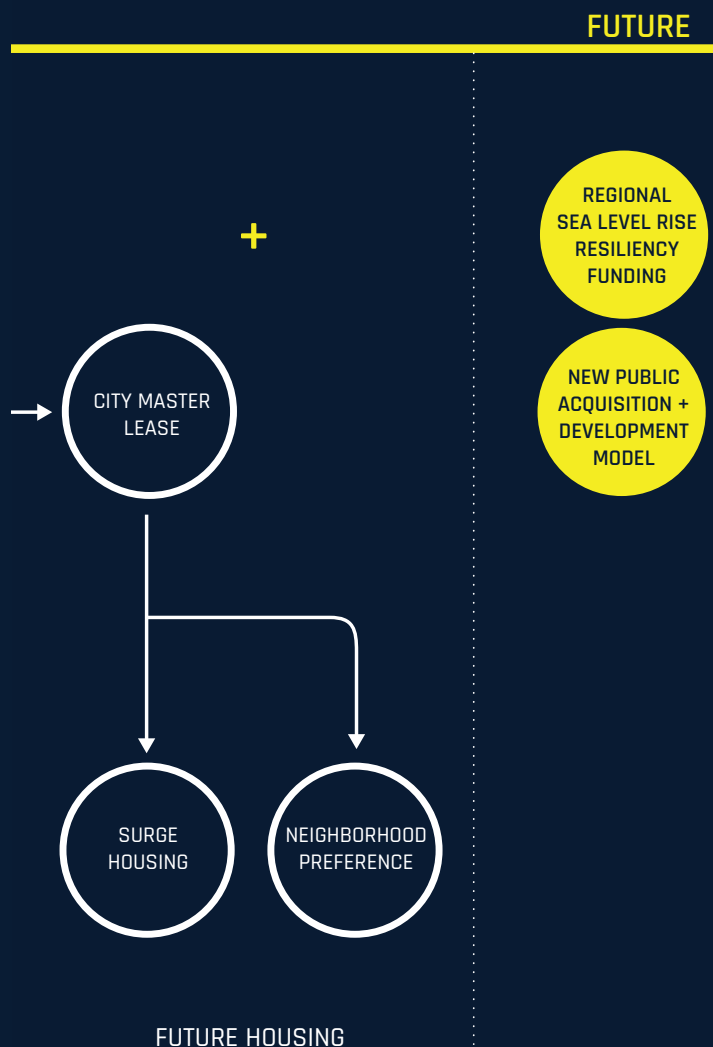
The supply-side involves the development of new housing suitable for the residents currently residing in lowland areas. Many of these strategies are covered in the report titled “Conceptual Preliminary Financing Strategy Sea Level Rise Resiliency—San Rafael Canal Area.” This report does a great job covering the local, state, and federal subsidies and grant programs that could be leveraged for new development. For the purposes of developing affordable housing, the County should consider a combination of Tax Increment Financing (TIF), Low Income Housing Tax Credits (LIHTC) and Project-based Section 8 vouchers.

California’s TIF law was approved in the early 1950s and dissolved in 2012. The **Enhanced Infrastructure Finance District (EIFD)** program has emerged in its place, allowing jurisdictions to use the incremental increase in property tax revenues to pay off the initial development bonds. The EIFD program “emphasizes projects that support sustainable community goals, energy efficiency, and reducing the carbon footprint of California’s economy.” This mechanism can be used to finance the necessary infrastructure required to develop new housing.

The **Low-Income Housing Tax Credit (LIHTC)** program is a federally-funded, state administered subsidy program designed to provide gap financing toward the development of affordable housing. Affordable housing developers compete for tax credits by responding to a State authored Qualified Allocation Plan (QAP), detailing development priorities. California’s current QAP requests a host of LEED-centric sustainable building practices, but makes no mention of “sea-level rise”, “flooding,” or “climate change.” It is possible that the use of LIHTC for this purpose would require a change at the State level.

Project-based Section 8 could provide rent subsidy to residents living in the new affordable housing development. Local Public Housing Authorities can allocate 20% of its authorized voucher units to project-based developments. Unlike traditional housing vouchers, which are allocated to families, project-based vouchers are attached to a given building. To understand if this program could be relevant in this case, more detail would need to be developed on how the voucher program would be administered in San Rafael.

Finally, it is worth noting that any successful relocation and return program hinge on the County’s ability to assemble the appropriate land. California is in the middle of a massive housing crisis, brought on in part, by a general unwillingness to develop new housing. For this strategy to be valid, local officials and members of the community must gather the political capital to support new housing development and policy. What’s more, land selected as suitable for new housing must be in a place that will allow the target population’s existing social and economic networks to thrive.



Model for San Rafael to prioritize upgrades to the existing housing and businesses, public infrastructure, and surge housing and neighborhood preference.

Appendix D:
Building Resilience: 4 Ways to Find Resources for Protection and Prevention



**Building
Resilience:
4 Ways to Find
Resources for
Protection &
Prevention**

Shalini Vajjhala
Financing the Future of
Resilient by Design
July 19, 2018

Capturing Value from "Avoided Losses"

1. Find the 'Biggest Losers': Who is currently losing money or facing a near-term shortfall without a specific resilience investment?
2. Bust Silos: Identify value across sectors.
3. Foster Flexibility: Integrate revenue & non-revenue generating projects and services.
4. Link Physical & Financial Protection: Leverage insurance-linked finance for resilience.



1. Finding the “Biggest Losers”

- Who loses money if a project doesn’t happen?
Identify savings to bring new stakeholders to the table with existing – *not new* – resources.
- Think about balance sheets today.
 - Lost revenue from business disruption
 - Escalating costs of protection
 - Affordability of critical services
- Focus on design decisions that link future benefits to current value to motivate action



2. Busting Silos for Cross-Sector Value

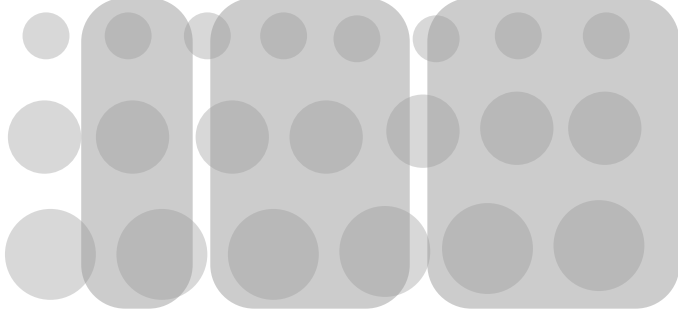
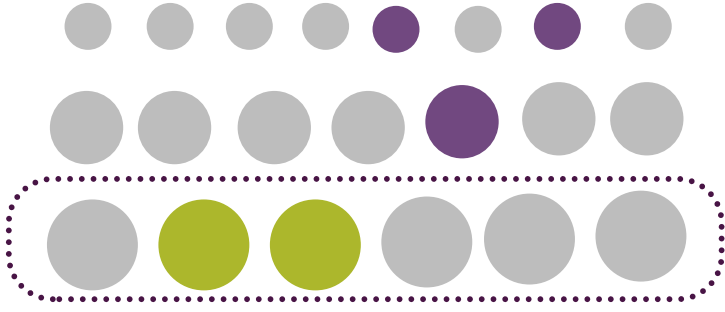
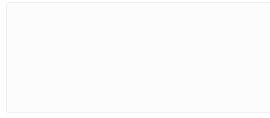
- Identifying multiple benefits isn't enough.
- Design teams need to quantify benefits and align beneficiaries up-front to secure funding or financing commitments for projects.
- Consider what features of your projects:
 - Make things cheaper for different depts.
 - Reduce long-term capital or O&M costs
 - Enhance service delivery in 2 or more sectors
- Focus on pain points (e.g. "dig once" savings)



Community Needs
& Design Vision

Department &
Agency Budgets

Structured
Finance



3. Linking Revenue & Non-Revenue Projects

- Look for incremental wins to add resilience benefits to ongoing revenue-generating projects – “Hitch your wagon to a bigger horse”
 - Transportation, transit projects
 - Real estate development
 - Utility system upgrades
- Identify project types where integration lowers costs and creates additional benefits (parking + flood water retention/detention)





4. Infrastructure as Financial Risk Reduction

- A lot of infrastructure is designed to reduce risk
 - Public sector assets & services are safer
 - AND insurance companies lose less money when public & private policy holders are better protected
- Resilience Bonds are one way of ensuring the *financial* value created by these public investments returns to the public sector



**without impact on public debt limits or credit ratings*

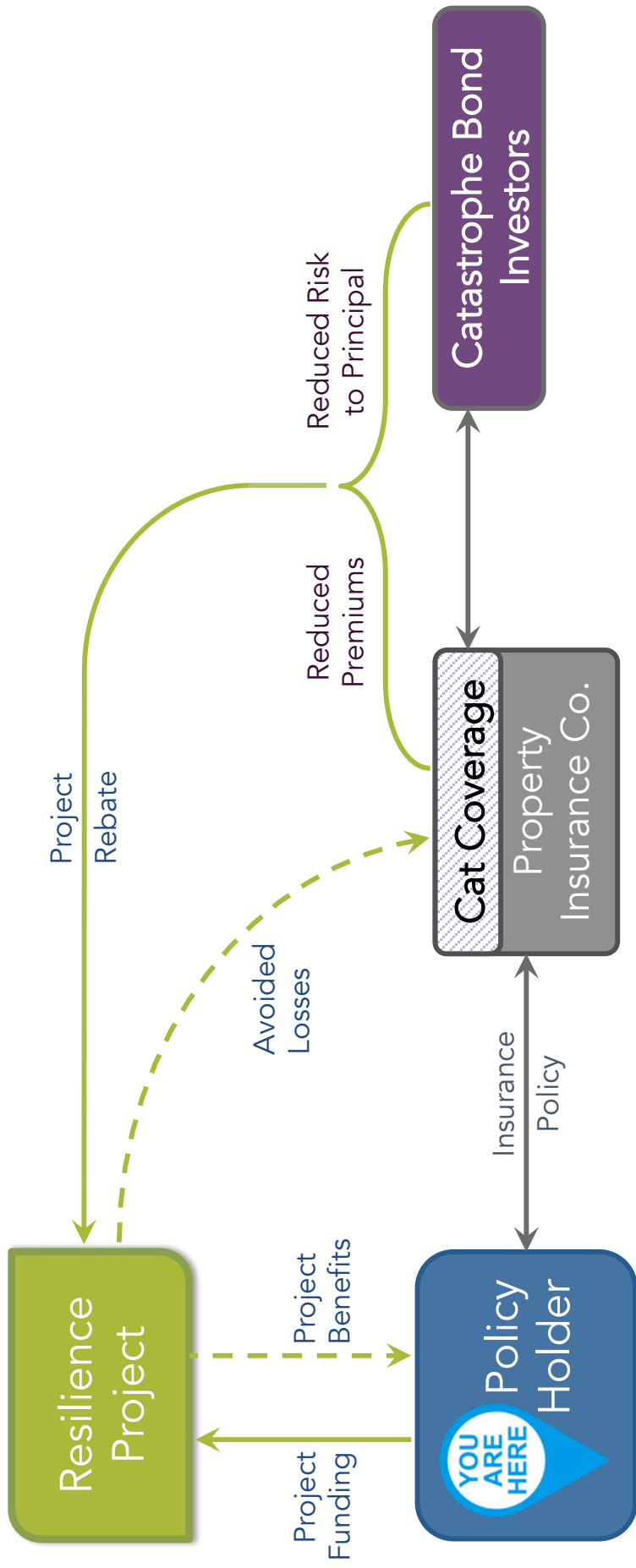
Three Entry Points for Cities & Utilities

- Peril/Liability: growing risks & expected losses
 - New Orleans Levee Systems
 - Thames Barrier (London)
- Insurance: required coverage or compliance
 - New York MTA (2013)
 - Amtrak (2015)
- Project: planned resilience projects
 - Planned Upgrade/Required Recertification
 - New Construction

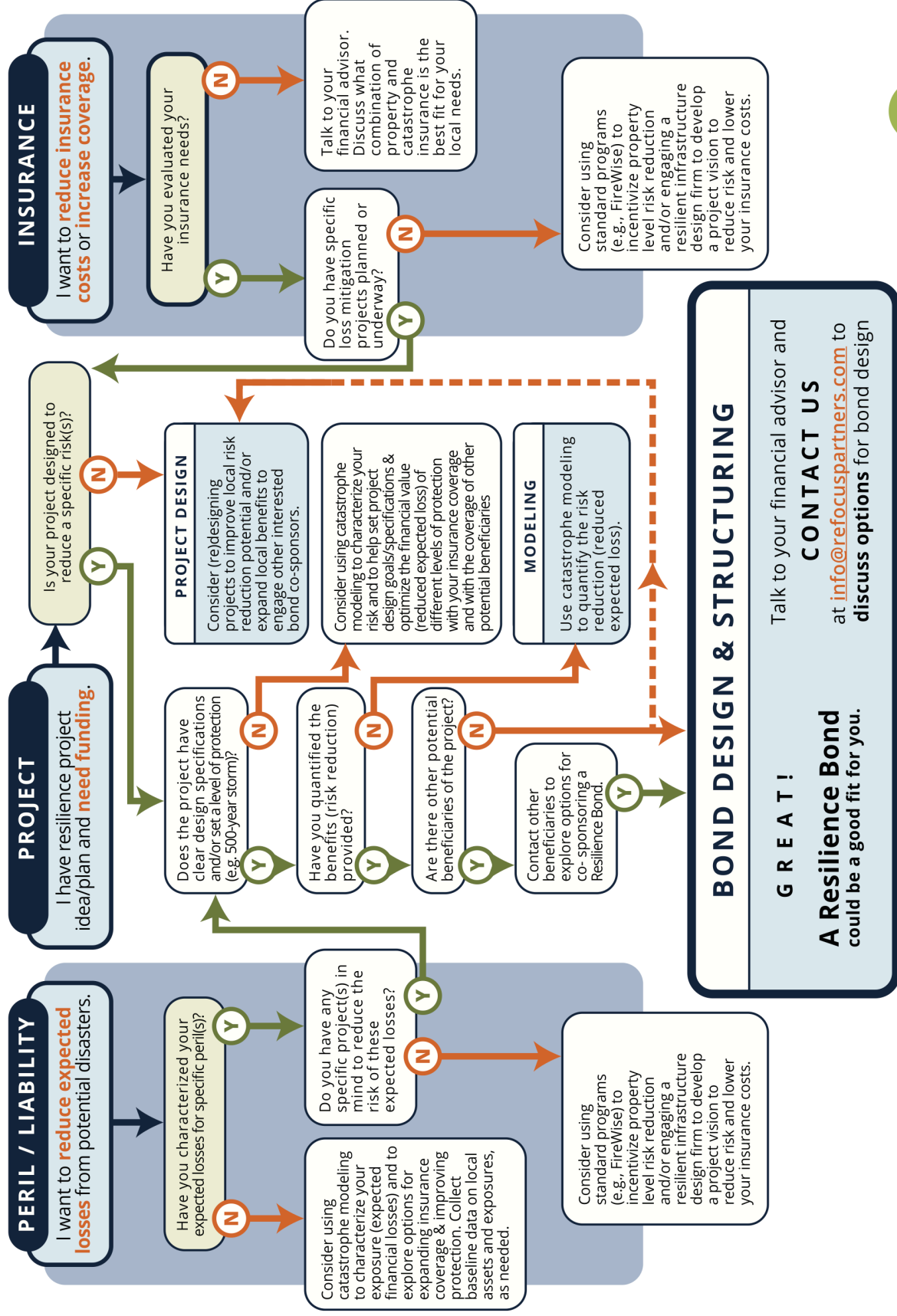




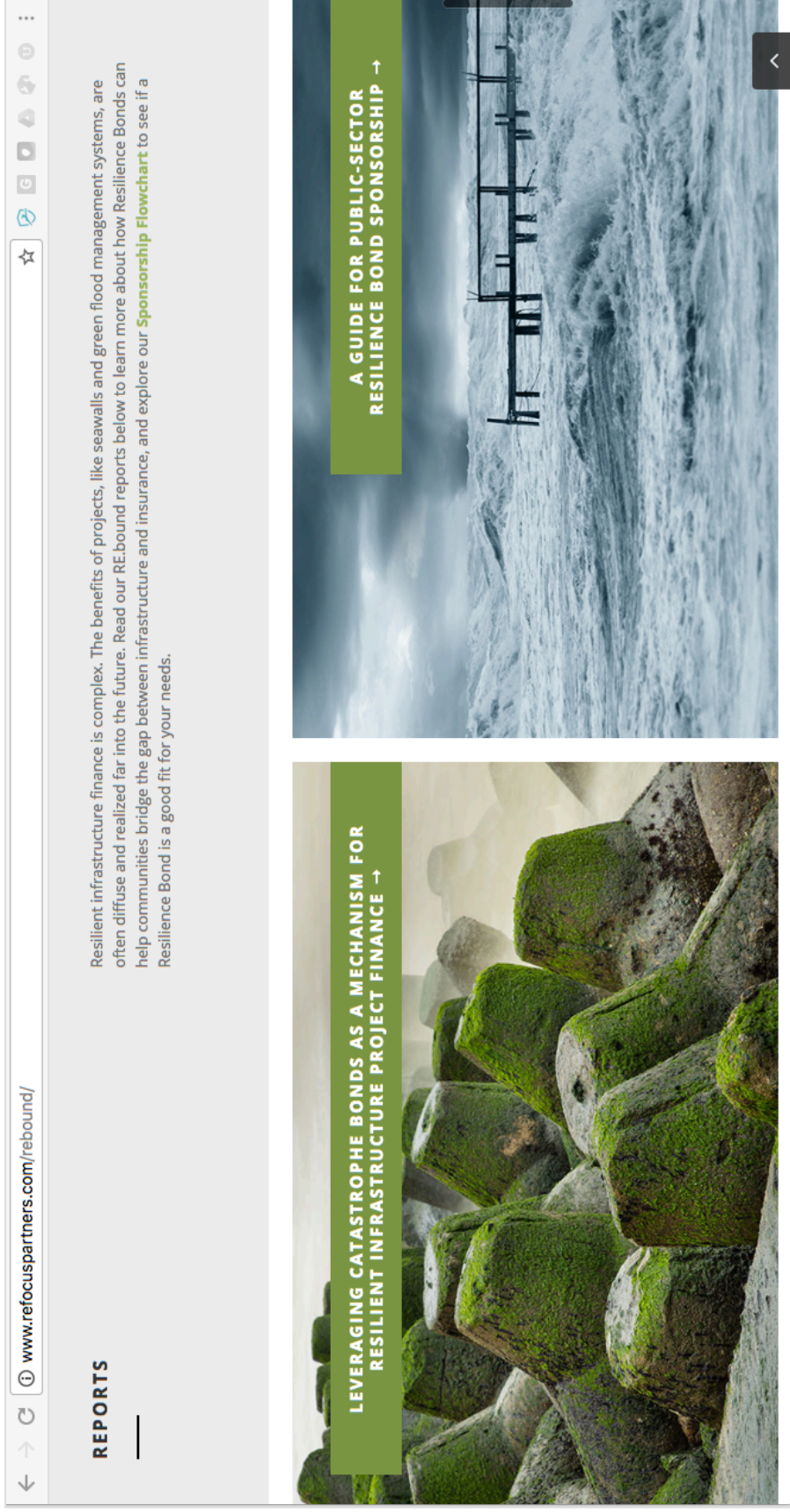
How Resilience Bonds Work



WHAT IS YOUR MAIN REASON FOR EXPLORING A RESILIENCE BOND?



Questions? Read more at:
www.refocuspartners.com/rebound



The screenshot shows a web browser window with the address bar displaying www.refocuspartners.com/rebound/. The page content includes a 'REPORTS' section with the following text:

REPORTS

Resilient infrastructure finance is complex. The benefits of projects, like seawalls and green flood management systems, are often diffuse and realized far into the future. Read our RE.bound reports below to learn more about how Resilience Bonds can help communities bridge the gap between infrastructure and insurance, and explore our [Sponsorship Flowchart](#) to see if a Resilience Bond is a good fit for your needs.

The page features two report thumbnails:

- LEVERAGING CATASTROPHE BONDS AS A MECHANISM FOR RESILIENT INFRASTRUCTURE PROJECT FINANCE →** (Accompanied by an image of moss-covered concrete blocks).
- A GUIDE FOR PUBLIC-SECTOR RESILIENCE BOND SPONSORSHIP →** (Accompanied by an image of a bridge over a body of water).



Appendix E:

State and Federal Grant Opportunity Information Matrices

Resilient by Design

Bay Area Challenge

Table 1	Resilient Infrastructure Funding Sources
Table 2	Alternative Financing Options for Bay Area Resilient Infrastructure
Table 3	Potential Sources of Adaptation Planning Grants for RbD after Rockefeller Foundation Funding Ends

[illegible]

SB1	California Transportation Commission	Data to Come	Data to Come	Data to Come	Data to Come	Data to Come	Data to Come	Data to Come
	Department of Transportation	Data to Come	Data to Come	Data to Come	Data to Come	Data to Come	Data to Come	Data to Come
November, 2018 Water Bond	Bay Restoration Authority	Data to Come	\$200 million	Data to Come	Matching grants for flood management, wetlands restoration	Data to Come	Data to Come	Data to Come
	Bay Area Conservancy	Data to Come	\$100 million	Data to Come	protection/restoration of watersheds	Data to Come	Data to Come	Data to Come
	(State Board check which)	Data to Come	\$400 million	Data to Come	Dry weather runoff capture and use	Data to Come	Data to Come	86050a
	California Coastal Conservancy	Data to Come	\$40 million	Data to Come	Dry weather runoff capture and use	Data to Come	Data to Come	86050e
	California Conservation Corps	50% to local conservation corps	\$40 million	Data to Come	Improve watersheds and habitat	Data to Come	Data to Come	86105

Table 2: Alternative Financing Options for Bay Area Resilient Infrastructure

Funding Agency	Funding Sources	Examples of Eligible Applicants	Examples of Eligible Projects	Examples of Funding Allocations	Past Grant Award Ranges	Notes and Sources of More Information
Bay Area Restoration Authority	Prop. AA, Nov. Water Bond	Public agencies, non-profit organizations, Indian Tribes, and owners or operators of shoreline parcels in SF Bay	Matching grants for flood managements, wetlands restoration	\$200 million from Nov. Water Bond (approximately \$23 million annually)	9 of 22 qualified 2017 Applications funded in 2018 ranging from \$150,000 to \$8 million	Projects not on SF Bay shoreline, Delta Primary Zone, or riparian restoration above SF Bay tidal influence are excluded from eligibility http://sfbayrestore.org/sf-bay-restoration-authority-grants.php
California Coastal Conservancy (Including Bay Area Conservancy)	Prop. 1, Cap and Trade, Prop. 68, Nov. Water Bond	Non-profits, Native American Tribes, landowners, government agencies	water sustainability, Urban Greening, Wetland Restoration, Anadromous Fish protection; acquisition; wetlands restoration, SF Bay restoration, coastal watershed restoration/restoration	\$20 million from Prop. 68 for SF Bay restoration; no funds available for planning purposes	Past awards have ranged from \$25,000 to \$4 million	Less than \$50 million remaining as of 2018; about \$8 million expected in FY 2019 http://sccc.ca.gov/grants/proposition-1-grants/
California Conservation Corps	Prop. 1, Prop 68, Nov. Water Bond	Local Conservation Corps	Improve & restore watersheds, wetland restoration, habitat restoration	\$40 million from Prop. 68	Data to Come	https://ccc.ca.gov/what-we-do/natural-resource-management/proposition-1-water-bond/
California Ocean Protection Council	Prop. 1, Prop. 68, Nov. Water Bond	Data to Come	Climate adaptation in coastal communities, including sea level rise, habitat restoration/protection, ocean acidification	\$100 million from Nov. Water Bond	Data to Come	Data to Come
Department of Fish and Wildlife	Prop. 68	Data to Come	Data to Come	Data to Come	Data to Come	Data to Come
Department of Forestry and Fire Protection	Prop 68	Data to Come	Forest restoration, including fuel reduction, watershed rehabilitation, conservation easements, forest resilience	\$50 million from Prop. 68	Data to Come	Data to Come
Department of Water Resources	Prop. 1	Data to Come	Collaborative Watershed Management; water infrastructure climate adaptation; collaborative water priority setting	Data to Come	Data to Come	Future grant applications early 2019 https://water.ca.gov/Work-With-Us/Grants-And-Loans/IRWM-Grant-Programs/Proposition-1
Strategic Growth Council	Cap and Trade	Data to Come	Data to Come	Data to Come	Data to Come	Data to Come
Water Resources Control Board	Prop. 1	Data to Come	Data to Come	Data to Come	Data to Come	Data to Come
Wildlife Conservation Board	Prop. 68, Cap and Trade,	Data to Come	Wildlife corridors, habitat protection, habitat connectivity, public access	Data to Come	Data to Come	Data to Come

Table 3: Potential Sources of Adaptation Planning Grants for RBD After Rockefeller Foundation Funding Ends

	Total Amount of Grants	Likely Size of Individual Grant	Adaptation Planning?	Type of Projects	Grant Cycle Schedule & Next Application Deadline	Website	Contact Person	Phone
California Coastal Conservancy								
	Cap and trade money							
	Climate Ready Program	?	?	Yes	Climate change adaptation	Quarterly / March 30, 2018	http://scc.ca.gov/grants/current-grant-opportunities/	Karyn Gear (Sonoma & Marin Counties) Matt Gerhart (All other Bay Area Counties) 510-286-4171 510-286-0317
California Ocean Protection Council	Nature Based Solutions in Marin County	\$750,000	\$50,000	Yes	Climate change and sea level rise	Annual / November 15, 2017	http://scc.ca.gov/2017/09/15/in-aturebased/	Marilyn Latta 510-286-4157
	Prop 1 funds	\$30 million	?	Yes, but for projects eligible for future funding under Prop 1	Water supply enhancement and flood control	Annual / February 23, 2018	http://www.opc.ca.gov/2015/05/prop1/	OPC Prop 1 grants@resources.ca.gov N/A
	Sustainable Communities Grant	\$25 million annually	?	Regional planning related to transportation	Planning	Annual / February 23, 2018	http://www.dot.ca.gov/hq/tpo/grants.html	Erin Thompson Priscilla Martinez-Velez 916-654-2596 916-651-8196
Prop 68	Adaptation Planning Grants	\$7 million annually	?	Climate change adaptation planning	Planning	Annual / February 23, 2018	http://www.dot.ca.gov/hq/tpo/grants.html	Erin Thompson Priscilla Martinez-Velez 916-654-2596 916-651-8196
	State bond measure	\$4 billion	?	Yes, so long as related to water and parks	Capital and planning for water and parks	?		
	Transformative Clir	\$142 million	?	Yes, for GHG reduction	Planning	Annual / November 30, 2017 (Co http://www.sgc.ca.gov/program:		Ena Lupine 916-322-0476
Regional Measure 3	Bridge tolls and bond	\$4.5 billion	?	Yes, so long as related to transportation	Transportation	?		
	Regional parcel tax	\$25 million annually	?	Yes	Bay restoration	Annual / November 2018	http://sfbayrestore.org/sf-bay-restoration-authority-grants.php	N/A
	Storm Water Proposition 1 Grant (Implementation Only)	\$90 million	?	No - Planning grants already awarded	Storm water management projects	Round 1: Closed Round 2: Tentative Late 2018 or Early 2019	https://www.waterboards.ca.gov/water_issues/programs/grant_loans/swgp/prop1/	Daman Badyal 916-319-9436
Department of Housing and Urban Development	National Disaster Resilience Grants	\$70 million in California grant awards in last cycle	?	Yes, for risk analysis	Disaster mitigation		http://www.hcd.ca.gov/community-development/disaster-recovery-programs/ndrc.shtml	
	Regional Resilience Assessment	?	?	Yes	Resilience for critical infrastructure		https://www.dhs.gov/regional-resiliency-assessment-program	
	FEMA - Hazard Mitigation Grants	\$13.8 billion	?	Yes, for "Hazard Mitigation Plans"	FEMA-recognized natural hazards		https://www.fema.gov/hazard-mitigation-grant-program	
Army Corps of Engineers	Continuing Authorities Program - San Francisco District	Up to \$100K feasibility phase; Up to \$10 Million Project	?	Yes	Storm and flood damage reduction, aquatic ecosystem restoration	Revolving Applications	http://www.spm.usace.army.mil/Missions/Projects-and-Programs/Continuing-Authorities-Program/	Mark Bierman 415-503-6508
	State Wetlands Planning	?	?	Yes	Wetlands benefits	Annual / Spring Deadline	https://www.epa.gov/wetlands/wetland-program-development-grants	Leana Rosetti 415-972-3070
	Coastal Resilience Grants	\$9 million (Matching Required)	Up to \$300K feasibility phase; up to \$1 million implementation	Yes	Resilience of coastal communities and ecosystems	Annual / Pre-Proposal Deadline: March 7, 2018	https://www.fisheries.noaa.gov/grant/noaa-coastal-resilience-grants	Melanie Gange 301-427-8664

Appendix F:

Design Team, Assets Defended, and Grant Intersection Matrices

Resilient by Design

Bay Area Challenge

Table 4	Funding Sources and Assets Defended
Table 5	Grant Opportunities by Project
Table 6	Major Wastewater Treatment Plants
Table 7	Major Transportation Assets
Table 8	Projects with Affordable Housing Emphasis

Table 4: Funding Sources & Assets Defended

Funding Source	Description	Affordable housing	Flood Control	Highways	Mass Transit	Wetlands	Wastewater
California Coastal Conservancy	Climate Ready Program Nature Based Solutions in Marin County		✓	✓	✓	✓	✓
California Ocean Protection Council	Prop 1 funds		✓			✓	
CalTrans	Sustainable Communities Grant	✓		✓	✓		
	Adaptation Planning Grants			✓	✓		
Prop 68	State bond measure		✓			✓	
Strategic Growth Council	Transformative Climate Communities Program	✓					
Regional Measure 3	Regional bridge tolls and bond measure			✓	✓		
San Francisco Bay Restoration Authority	Regional parcel tax					✓	
California Water Boards	Storm Water Proposition 1 Grants and Loans		✓			✓	
Department of Housing and Urban Development	National Disaster Resilience Competition		✓				
Dept of Homeland Security	Regional Resilience Assessment Program			✓	✓		✓
	FEMA - Hazard Mitigation Grant Program		✓				✓
Army Corps of Engineers	Continuing Authorities Program - San Francisco District		✓			✓	
Environmental Protection Agency	State Wetlands Planning Grants					✓	
NOAA	Coastal Resilience Grants		✓			✓	

Project / (Location) / Design Team

Table 6: Major Wastewater Treatment Plants

	BIG+One+ Sherwood	Bionic	Field Operations	Hassell	The Home Team
Central Marin Sanitary District		✓			
City of South San Francisco				✓	
City of Sunnyvale			✓		
East Palo Alto Sanitary District			✓		
San Francisco PUC	✓				
Silicon Valley Clean Water			✓		
West County Wastewater District					✓

Table 7: Major Transportation Assets

	All Bay Collective	BIG+One+ Sherwood	Bionic	Common Ground	Field Operations	Hassell+	Permaculture
Hwy 101			✓		✓	✓	✓
Hwy 880	✓						
Hwy 37				✓			
Hwy 84					✓		
BART	✓						
CalTrain		✓				✓	

Table 8: Projects with Affordable Housing Emphasis

Team Name	Affordable Housing
All Bay Collective	✓
Big+One+Sherwood	✓
Bionic	✓
Common Ground	
Field Operations	✓
Hassell	✓
Permaculture	✓
Public Sediment	
The Home Team	✓