

# Sea Level Rise Adaptation Funding and Investment Framework

## Financing the Future Working Group

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# Sea Level Rise and the Bay Area

The Bay Area is defined by its relationship to water, with our communities and regional culture centered around the Bay, the Delta, and the Outer Coast. **So how do we define what's at stake with sea level rise (SLR)?**

While the Framework explores key financial estimates to tackle this challenge, **it's important to remember why we want to prioritize the needs of people & places we deeply care about.**



# What's at Risk if We Don't Adapt?

## Assets at risk of SLR flooding<sup>1</sup>:

**75,000**  
**total households,**  
including **12,000**  
in the most  
socially vulnerable  
communities<sup>3</sup>.

**200,000**  
**total jobs,** and  
**15,000** total  
businesses.

**20,000**  
**vulnerable acres**  
**at risk,** including  
wetlands,  
lagoons, and tidal  
marshes.<sup>3</sup>



**Estimates of a Subset of Assets at Risk:**  
*(in 2022 dollars)*

**\$85 billion**  
Estimated *assessed value* of parcels at risk<sup>1</sup> (market value is likely to be much higher)

**\$151 billion**  
Estimated value of major roadways at risk<sup>2</sup>

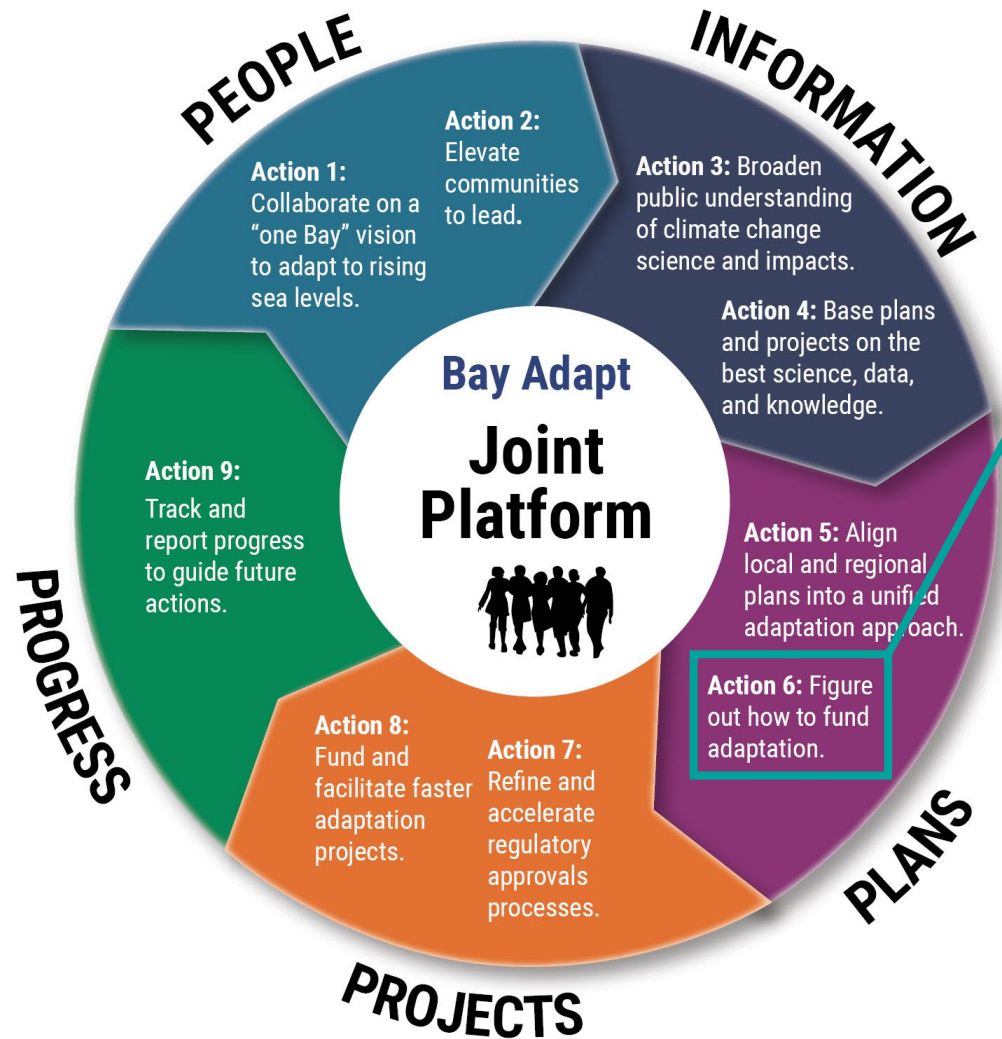
<sup>1</sup> Assuming 4.9 feet of inundation by 2050.

<sup>2</sup> Calculated based on 230 miles of vulnerable major class roadways, using a median transportation adaptation cost of \$125,000 per foot. Adaptation assumes only elevation or realignment and not protection in place or multi-benefit solutions.

<sup>3</sup> Social vulnerability defined by the high and highest levels of BCDC's Community Vulnerability Data.

<sup>4</sup> From Adapting to Rising Tides Bay Area, 2020

# Bay Adapt Joint Platform



## Action 6: Figure out how to fund adaptation

- Task 6.1:** Expand understanding of the financial costs and revenues associated with regional adaptation.
- Task 6.2:** Establish a framework for funding plans and projects.
- Task 6.3:** Help cities and counties expand ways to fund adaptation planning projects.

# Building on Past Efforts with the Framework: Quantifying Needs and Revenues for Adaptation

Focus Areas

**1**

Update and improve regional accounting of anticipated sea level rise adaptation projects.

Outcomes

- Update prior regional analyses with local projects from recent planning efforts.
- Estimate the regional sea level rise adaptation need through 2050.

**2**

Update and characterize existing revenue sources for sea level rise adaptation.

- Inventory and forecast revenues for new state and federal funding programs.
- Characterize how existing adaptation funds are dispersed and for what purpose.

**3**

Study how new revenues for sea level rise adaptation needs can be raised most equitably.

- Analyze a range of possible revenue measures at different scales, to understand equitable approaches to close the sea level rise funding gap.

# Inventory of Adaptation Needs

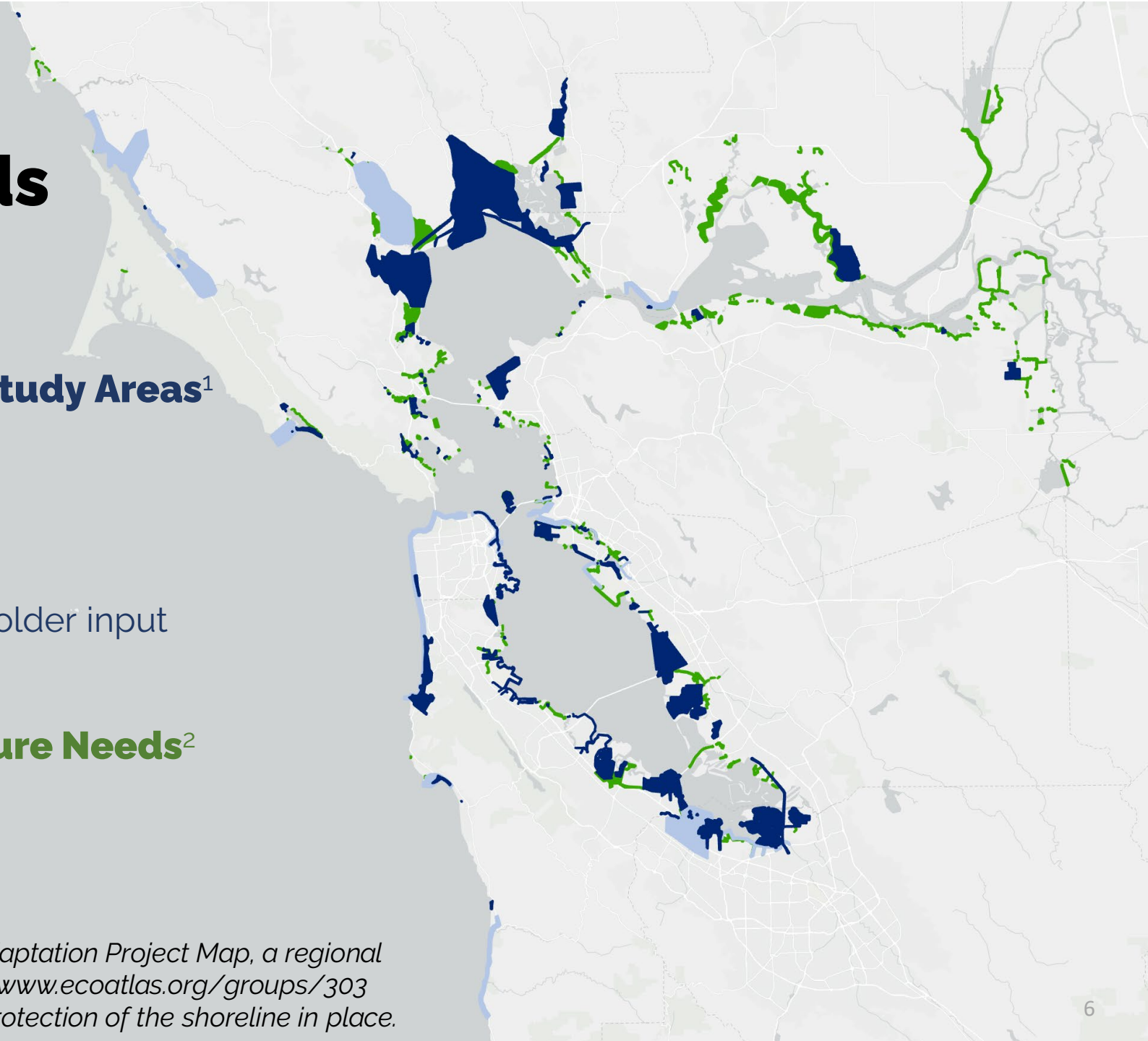
## Local Adaptation Projects and Study Areas<sup>1</sup>

- Local Adaptation Projects
- Local Study Areas

192 projects in original inventory  
132 projects updated with stakeholder input  
Includes 47 new projects added

## Potential Protective Infrastructure Needs<sup>2</sup>

- Placeholder Adaptation Needs



<sup>1</sup> Includes projects identified in BCDC's Shoreline Adaptation Project Map, a regional project inventory hosted through EcoAtlas: <https://www.ecoatlas.org/groups/303>

<sup>2</sup> Placeholder needs determined by assuming the protection of the shoreline in place.

# Adaptation Needs

What is the regional estimate to fund adaptation?

# \$110 billion

Estimated cost of sea level rise adaptation through 2050 (in Year of Expenditure dollars)

- \$52 billion: Estimated cost for known or planned projects
- \$54 billion: Estimated placeholder cost for areas with adaptation needs
- \$3 billion: Estimated additional sediment management needs<sup>1</sup>

## The estimate includes:

- Assumed “protect in place” adaptation action for all vulnerable shoreline, including low density areas and agricultural land
- Assumed areas vulnerable to up to 4.9 feet of total water level are protected

## The estimate does not include:

- Alternative approaches that do *not* protect in place, which could change the cost estimate for adaptation in some shoreline segments
- Building code or other local policy adjustments
- Riverine and groundwater adaptations
- Adaptation plans made by utilities

<sup>1</sup> Estimate developed by BCDC and SFEI analysis.

# Comparing the Numbers

Cost of adaptation compared to cost of inaction

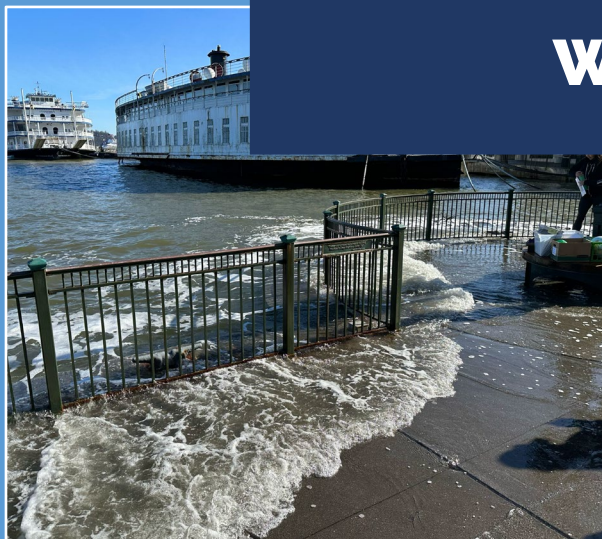
# \$110<sub>B</sub><sup>1</sup>

Estimated cost of sea level rise adaptation through 2050

# \$230<sup>+</sup><sub>B</sub><sup>2</sup>

Estimated value of a subset of assets at risk through 2050

**The cost of inaction is far higher than the cost of adaptation;  
We stand to lose much more if we do not act**



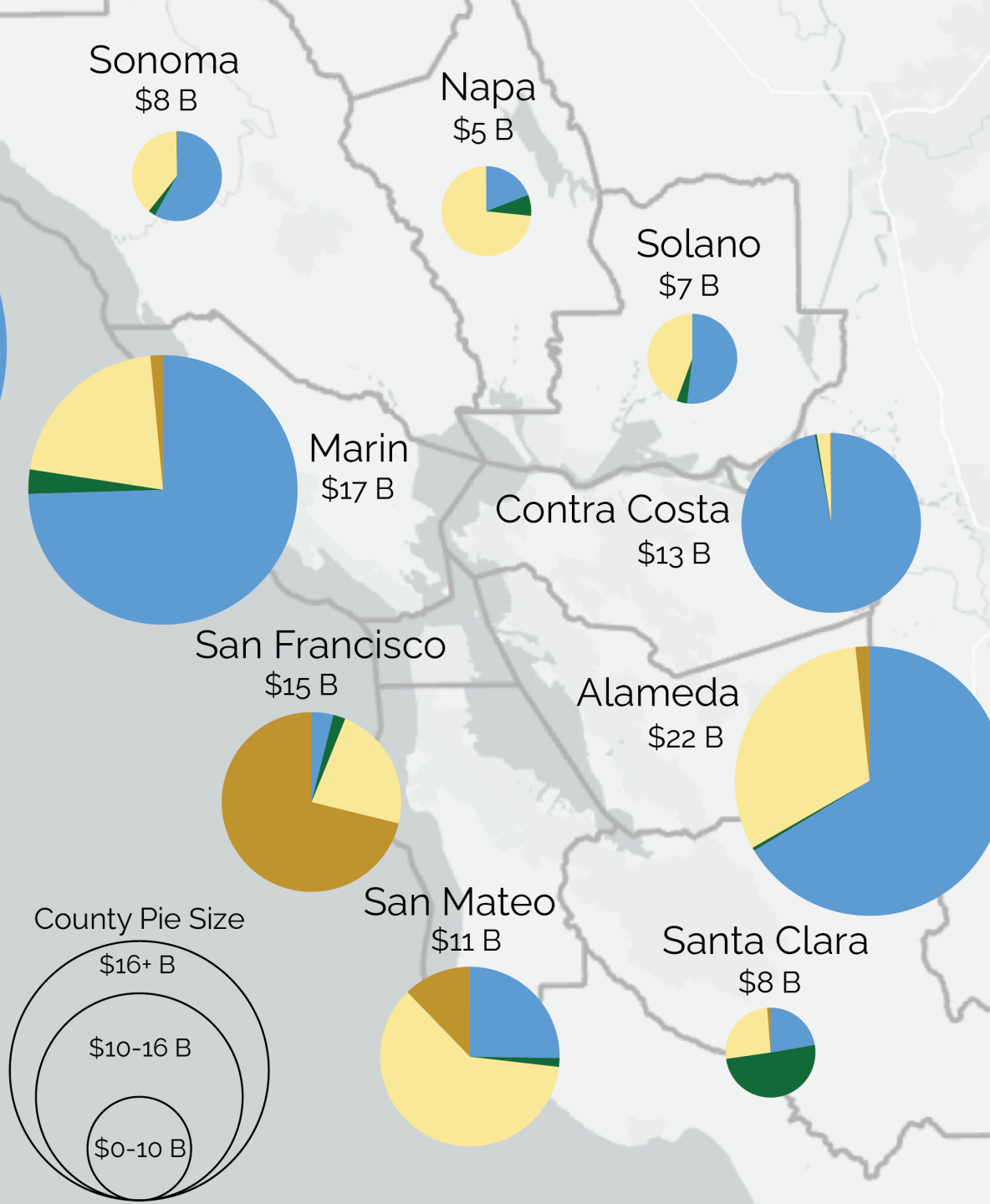
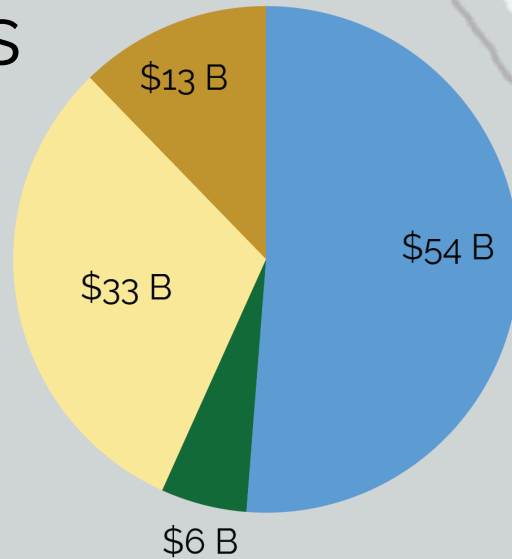
<sup>1</sup> In year of expenditure (YOE) dollars. <sup>2</sup> In 2022 dollars. Photos: CA King Tides Project 2023.



# Adaptation Needs

## Additional Findings

- Most planned projects are hybrid, representing a focus on multiple benefits.
- Alameda and Marin are estimated to have the highest adaptation costs.
- Significant implementation gaps are present across the region; the largest gaps are in Alameda, Contra Costa, and Marin<sup>2</sup>.

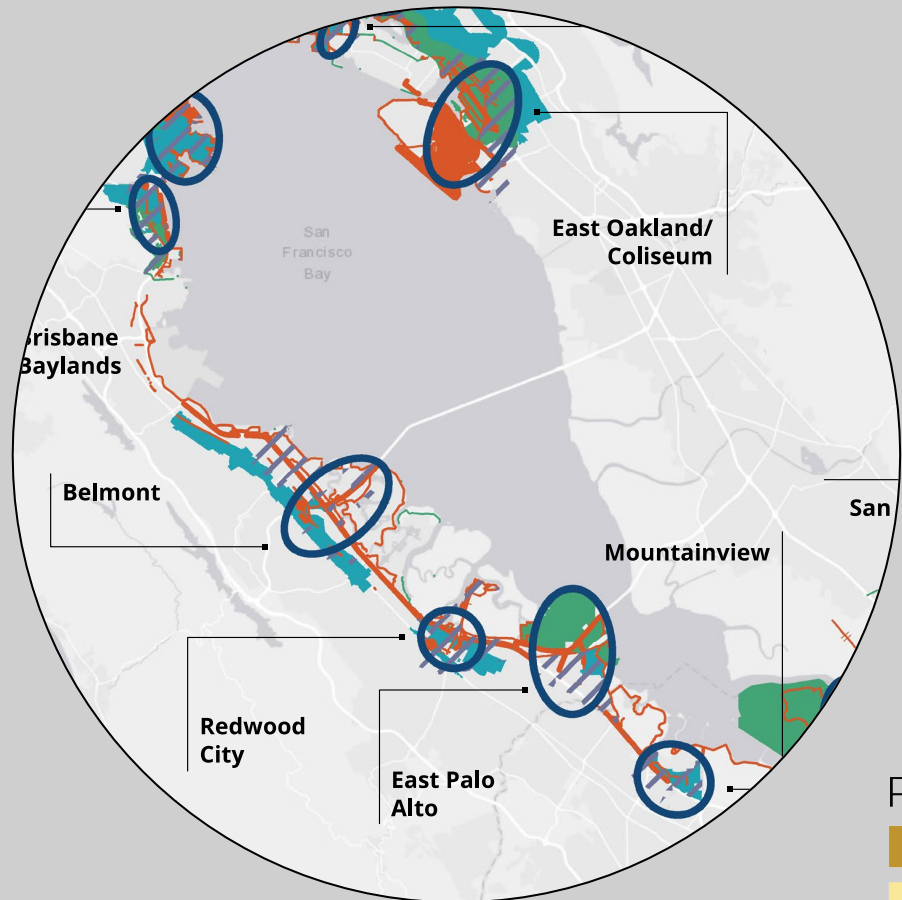


<sup>1</sup>Values represented in Year of Expenditure dollars; Regional cost includes \$3B in additional sediment need.  
<sup>2</sup>Locally identified projects do not account for studies or plans without defined interventions.

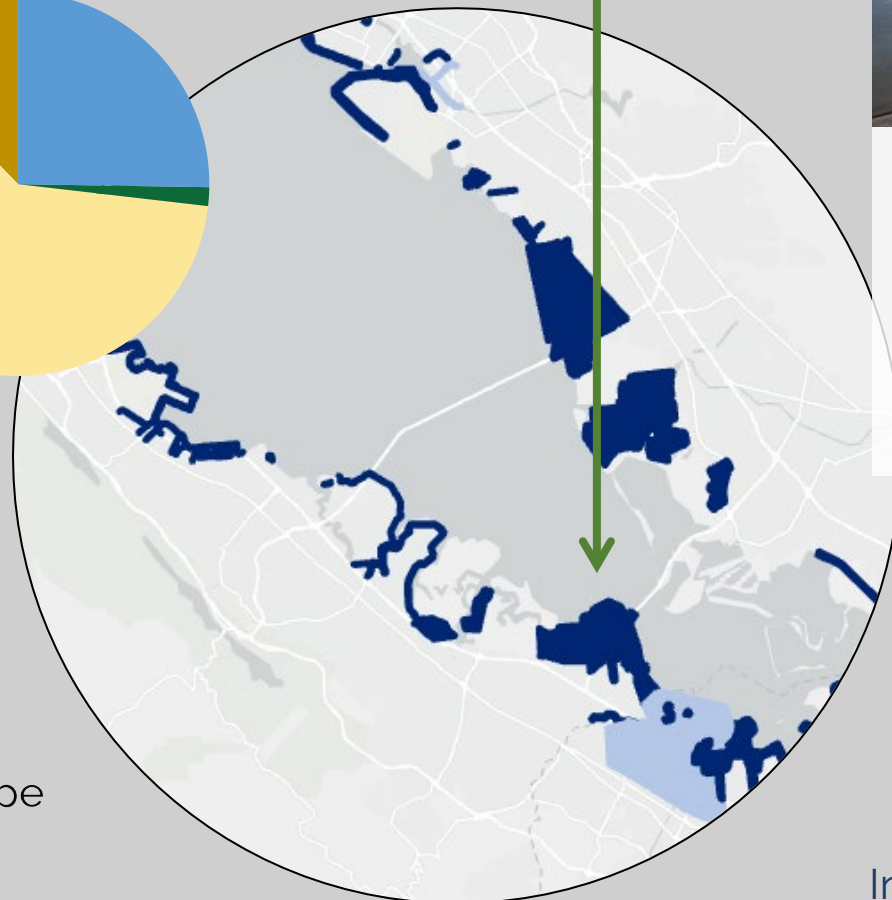
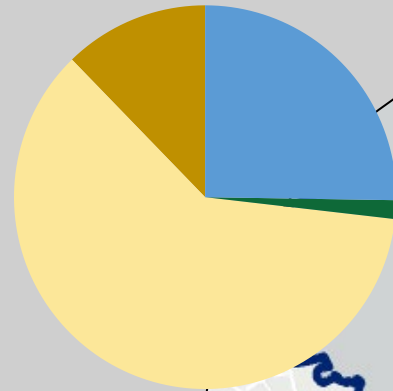
# County Highlight

What do these findings mean to each county's planning?

## San Mateo County "Hotspots"



San Mateo  
\$11b



## SAFER Bay



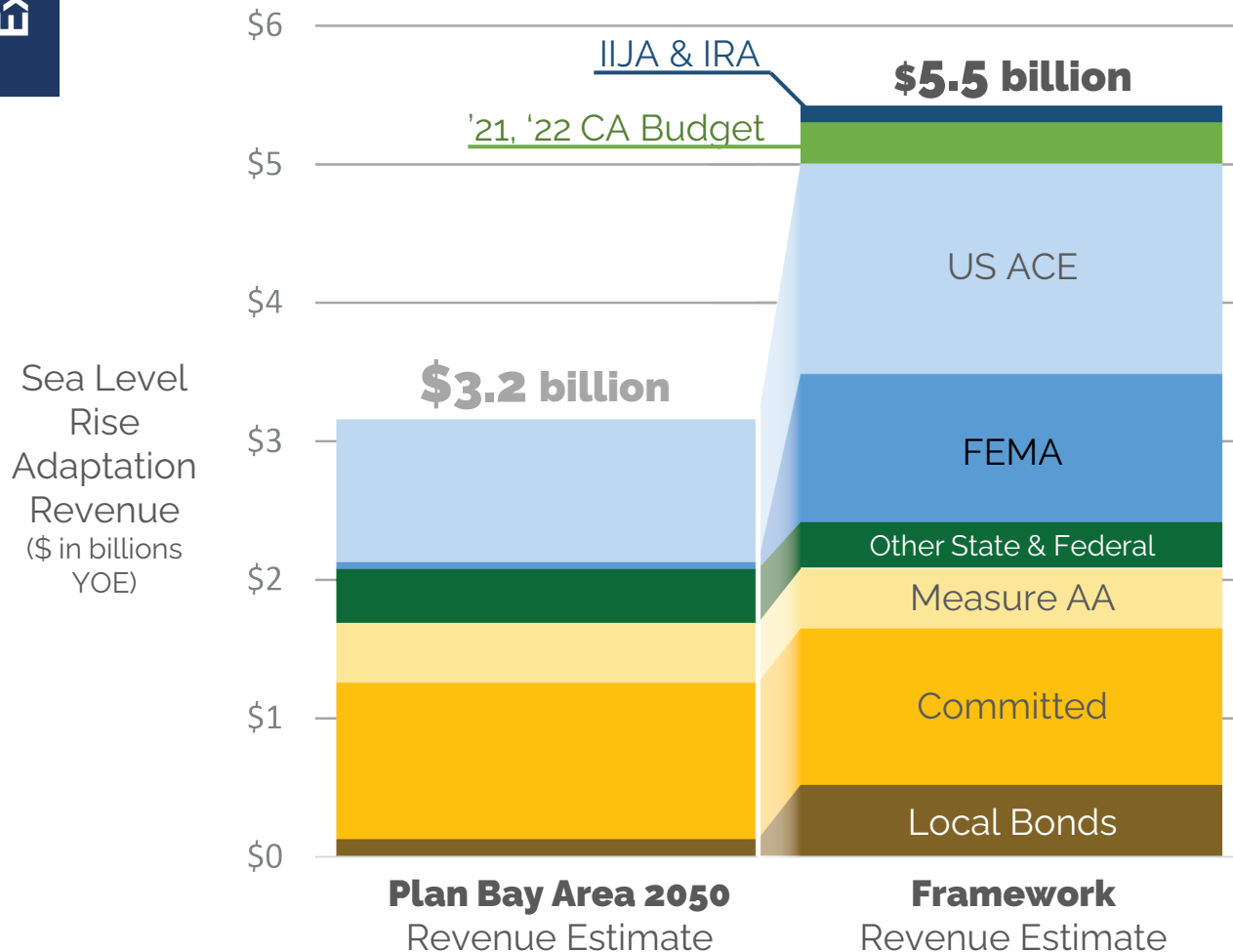
*Levees and dikes;  
restoration*

Estimated Cost:  
\$228 million  
Status: In Progress



# Forecasting Existing Public Revenues

## Updated Revenue Forecast (2022-2050)



### Key Updates

- Federal action by IIJA & IRA account for ~\$120 million in new revenues.<sup>1</sup>
- 2021 and 2022 State budget line items account for ~\$800 million in new revenues.<sup>2</sup>
- Emergence of FEMA's BRIC program greatly increases anticipated FEMA revenue.
- Inclusion of \$425 million SF Prop A (2018)<sup>3</sup> increases locally generated sources.

<sup>1</sup> US ACE's IIJA allocation increase is not yet accounted for. It may add between \$0.02-0.15 billion. Waiting for US ACE feedback.

<sup>2</sup> The Governor's proposed 2023 budget is estimated to reduce the regional estimate by \$200 million.

<sup>3</sup> Prop A was not included in Plan Bay Area 2050 because the analysis focused on areas that flooded with only 2' of permanent rise.

# Exploratory Funding Sources: Context

To fill this funding gap, the region may need multiple additional funding sources at multiple scales.

The Framework explored three possible new revenue measures at the local, county, and regional scales to understand:

- **Revenue generation potential:** how much funding can be raised annually?
- **Bond issuance potential:** how funding can different measures raise for near-term project implementation?
- **Initial equity implications:** who pays?

Three measures were reviewed based on their overall feasibility and regional precedence.



<sup>1</sup> Including value capture mechanisms such as Community Facilities Districts and Tax Increment Financing.

**Note:** This Framework research is high level and exploratory only, and it is intended to provide insight for further research and discussion in the years ahead.

# Case Studies for Three Funding Measure Types

**Key Finding:** Regional and/or local measures will not be capable of closing the funding gap. Additional funding from federal and/or state sources will also be necessary.

## Scale: County & Regional

Regional and county taxes distribute tax burden across wider base

## Scale: District-based (sub-local)

Only parcels that directly benefit pay

### Parcel Tax

- Typically a flat rate property tax: each parcel charged the same amount
- Does not account for value or size of the property

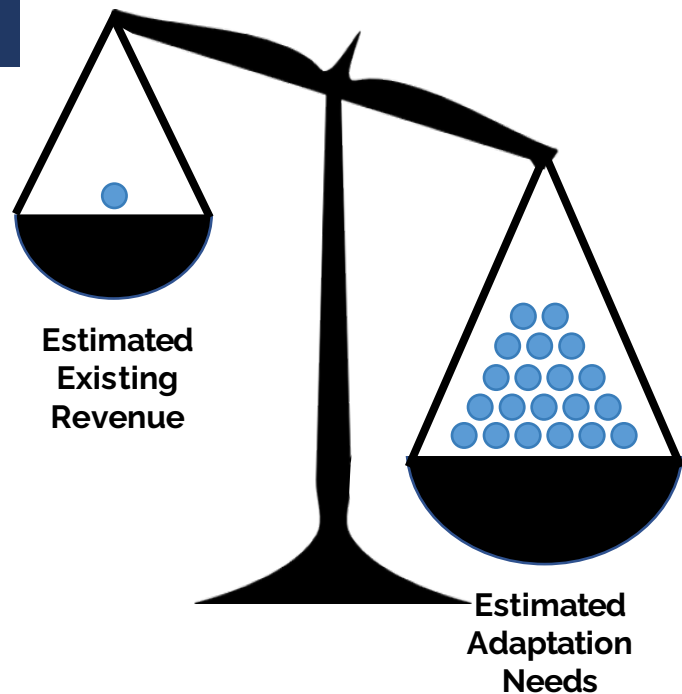
### Ad Valorem Property Tax/GO Bond

- Property-related tax that *can* be progressive: higher assessed properties pay more
- Subject to Prop 13 limitations

### Assessment District

- Directly tied to specific benefits
- Most feasible in areas with greater resources and/or more direct impacts of SLR

# Recap of Key Learnings



● Represents \$5.5 billion

1. **Mix of “Green” and “Grey”.** Roughly half of the known project costs are for green or hybrid projects, reflecting the region’s shift towards multi-benefit adaptation.
2. **Significant Funding Gap.** Current revenues are inadequate to meet the need, leaving a funding gap of over \$100 billion.
3. **Key Differences between Counties.** More than 50% of the costs are in only three counties, and the level of local planning for sea level rise varies widely.
4. **Multiple Fund Sources Required.** Even with prioritizing and phasing adaptation projects, there is no single funding measure that will be able to fill the gap.
5. **Prioritizing Equity.** GO bonds/ad valorem property taxes place a lower burden on socially vulnerable areas while providing a greater benefit to socially vulnerable areas than their regional share.
6. **Importance of Regional Approach.** Differences among counties in terms of vulnerability, level of planning, and our findings are all indicative of the need for a regional approach for funding and project development to avoid leaving anyone behind.

# What's Next After the Framework?

- 1. Prioritize SLR investments through upcoming plans to reduce the funding gap.** Includes exploring which resilience projects require early actions and which low-density areas might be more appropriate for lower cost solutions. **[BCDC & MTC/ABAG]**
- 2. Explore how envisioned regional measures can make communities and transportation more resilient.** To the extent possible, planned measures for affordable housing and transportation should integrate policies or programs to advance more resilient outcomes. **[MTC/ABAG]**
- 3. Complete and maintain the development of the Shoreline Adaptation Project Mapping Program** to ensure that the region has access to the best possible inventory data. **[BCDC, others]**
- 4. Engage, educate, and mobilize elected officials to accelerate advocacy at the federal and state levels to secure more monies for the Bay Area.** Messaging the magnitude of the need here in the San Francisco Bay Area and competing for available funds will be key. **[BCDC, MTC/ABAG, BARC, others]**
- 5. Better define lead roles for funding plans and projects in the Bay Area.** The lack of clear roles and process to secure monies and distribute them equitably hinders the Bay Area's ability to mitigate climate impacts. (Joint Platform Task 6.2) **[BCDC, MTC/ABAG, BARC, others]**
- 6. Support cities, counties, and the private sector to develop funding and financing tools** at multiple scales. (Joint Platform Task 6.3) **[TBD]**

## Discussion Questions

- What are the best forums to engage, educate, and mobilize elected officials for accelerated advocacy for state and federal funding?
- How do we catalyze funding and financing now that we have real data to back up our needs?
- Who should spearhead decisions around the funding governance question (and how should they decide)?