Proposed Funding Pathways for Adaptation to Climate Change in California

Final Report – April 30, 2021

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Table of Contents

| Executive Summary | 1 |
|---|---|
| Introduction | 3 |
| Funding Pathway Proposal 1: Transportation Funding for Collaborative Adaptation Planning | 7 |
| Funding Pathway Proposal 2: Extreme Heat Policy and Institutional Reform | 3 |
| Funding Pathway Proposal 3: Resilience Financing Districts for Funding Climate Change Adaptation 23 | 3 |
| Funding Pathway Proposal 4: Wildfire Risk Reduction | 4 |
| Conclusions | 2 |
| APPENDIX A. Scope of Potential New Revenue Sources | 4 |
| APPENDIX B. List of People Consulted | 9 |

This report is authored by the OnClimate Team with support from Resources Legacy Fund.

The OnClimate Team brings together four experts with decades of experience in the fields of state and local climate change adaptation policy, municipal and conservation finance, and grant funding sources. Our recent experience includes developing funding and financing solutions for the nine adaptation projects developed through the Bay Area Resilient by Design Challenge.

Resources Legacy Fund (RLF) works with philanthropists to conserve land, water, and ocean resources while advancing healthy communities and social equity. RLF partners broadly to support diverse community-based groups, advance equitable policies, and secure public funding for the environment, climate change resilience, and community health. For more information, <u>contact us</u>.

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Executive Summary

As the impacts of climate change increasingly disrupt Californians' well-being and the state's economy, efforts to plan and implement climate adaptation strategies must accelerate. Building on recent research on strategies to promote public and private investment in climate resilience and adaptation, Resources Legacy Fund (RLF) worked with the OnClimate Team to develop four funding pathways that address pressing climate resilience needs in California. A "funding pathway" is a cohesive set of public policies designed to increase and allocate spending to drive effective adaptation to an identified climate risk and achieve greater community resilience to climate change.

Purpose: The objective of this report is to present pathways that could increase funding for climate adaptation and resilience in California in a fiscally responsible and socially equitable manner. We focus on funding current adaptation priorities with solutions that are reasonably feasible now or in the near-term given current trends. We provide an equity analysis and implementation strategy for each pathway.

Methodology: We developed the four funding pathway proposals through interviews with state and local policy makers, researchers, and representatives of non-profit organizations. Through a gap analysis, we identified seven climate adaptation funding gaps across five climate risks. We further developed these concepts into four funding pathways and refined them through additional research and interviews. We then tested the proposals by soliciting feedback from a wide range of stakeholders through an online workshop.

Incorporating social equity: Each pathway addresses social equity by considering how

low-income households and disadvantaged communities are affected by:

- The distribution and scale of climate change impacts
- The structure of the funding source
- The distribution of the funded benefits

Our proposals recognize that low-income households and disadvantaged communities tend to be more vulnerable to climate change impacts and have tended to receive lower levels of public services and investment. They also recognize that many potential tax revenue sources are regressive as they represent a larger share of low-income taxpayers' earnings. The proposed pathways make the case that if revenue sources cannot be progressive, then the expenditures for climate change adaptation need to be socially equitable.

Starting point for further discussion: RLF aims to promote a robust dialogue about ways to pay for climate adaptation and resilience, and does not necessarily endorse every recommendation herein. RLF and the authors recognize that some proposed pathway elements could be controversial. The proposals serve as a starting point for further discussion of potential funding sources and financial tools that could enable California communities to prepare for and respond to the effects of climate change in a fiscally responsible and equitable manner.

Overview of four proposals: Table ES.1 provides an overview of the four proposals. The timeline for implementation reflects the level of effort required for the proposed legislative or other changes. We also summarize funding estimates, social equity considerations, and implementation needs.

| Funding Pathway | 1. Transportation funding for collaborative adaptation planning | 2. Extreme heat policy and institutional reform | 3. Resilience financing districts for funding climate change adaptation | 4. Wildfire risk reduction funding pathway |
|---|--|--|--|---|
| Climate risks addressed | Sea level rise | Extreme heat | Multiple risks | Wildfire |
| Description | Expand an existing grant program to dedicate funds to collaborative regional transportation planning to adapt to sea level rise | Advance policies that lay the groundwork for funding extreme heat responses. Identify needed heat- related regulatory standards and establish a governance structure | Enable creation of Resilience Financing Districts that consolidate and expand currently authorized local government powers needed for funding and financing climate change adaptation. | Introduce (1) a small surcharge on all property and casualty insurance premiums statewide, and (2) a higher surcharge on insurance lines relevant to wildfire risk on properties within the wildland- urban interface. |
| Timeline for implementation | 1-3 years | 2-5 years | 2-5 years | 3-7 years |
| Estimated amount of funding this pathway could generate | \$10 million annually | Depends on scope of policy change. Seek to meet funding needs through a combination of public grants and incentives for private sector investment. | Depends on scale of district/ number of parcels, level of parcel-based fee, could range from tens of thousands to hundreds of millions of dollars annually | \$514 million annually |
| Social equity considerations | At least 50% of each project study area to include disadvantaged communities | Focus expenditures on low-income households and disadvantaged communities; anticipate impact on cost of housing | Creates a social equity fund for a mandatory allocation of RFD tax revenues and/or bond proceeds. | Focus expenditures on disadvantaged communities; potentially progressive tax structure |
| Implementation needs | Advocate for legislative change: Re-fund Caltrans program | Build coalition and advocate for legislative change | Build coalition and advocate for legislative change | Build coalition and advocate for legislative change |

Table ES.1. Proposed Funding Pathways for Climate Adaptation in California



Introduction

Purpose of funding pathway proposals

This report identifies four proposed funding pathways to address pressing climate resilience needs in California, with a corresponding equity analysis and implementation strategy for each. The proposals serve as a starting point for further discussion of potential funding sources and financial tools to enable state and local governments to prepare for and respond to the effects of climate change in a fiscally responsible and equitable manner. A wide range of stakeholders participated in an online workshop in February 2021 to refine the proposals and discuss methods of implementation.

The four pathway proposals can be read independently of one another. This introductory section presents the proposals' purpose, how we developed them, and how we have accounted for equity. Following the four proposals, we provide a detailed discussion of new potential tax-based revenue sources that could support the proposed funding pathways (<u>Appendix A</u>).

<u>Methodology: How funding</u> <u>pathway proposals were</u> <u>developed</u>

We developed the four funding pathway proposals through interviews with state and local policy makers, researchers, and representatives of non-profit organizations. We first conducted a gap analysis to identify adaptation responses for which increased funding would have the greatest impact and to understand the potential for meeting those funding needs in the short- to medium-term. We identified seven climate adaptation funding gaps across five climate risks (Table 0.1). To select adaptation funding gaps on which to base the pathways, we sought areas of convergence among interviewees on the impact additional funding could have on a particular adaptation response; the urgency of deploying the adaptation response; and potential opportunities for private philanthropy to support overcoming the identified funding gaps

| Climate Risk | Priority Climate Adaptation Response | Potential Funding Pathways |
|----------------|--|---|
| | | Statewide insurance surcharge related to statewide benefits of wildfire risk reduction |
| | Fireshed-scale fuels | Expanding and extending existing federal and state funding for fuels reduction as part of a larger forest resilience strategy |
| | reduction | Federal, state, and philanthropic funding sources that could support the development of markets for low/no-value biomass |
| Wildfire | | Public insurance pool at the state or regional level to share risk with private market (including stakeholder engagement) |
| | Neighborhood-scale | State Greenhouse Gas Reduction Fund (GGRF), philanthropy, or other funding to support the development and replication of local funding models for fuels reduction and use of building regulations |
| | fuels reduction | Financing districts or jurisdiction-wide revenue measures to support local fuels management efforts, possibly incentivized with state participation through property tax increment sharing. |
| | Increase cooling in residential buildings | Shift some resources for heating and energy efficiency retrofits to fund cooling retrofits and technologies |
| Extreme | | Incentives and regulations for local governments to include cooling requirements in building codes. |
| heat | M | Expand funding and selection criteria for existing urban greening and forestry grant programs to prioritize cooling co-benefits |
| | Municipal intrastructure | Focus and expand federal emergency management funding for resilience centers |
| | Regional-scale support | Expand on the initial success of the San Francisco Bay Restoration Authority (SFBRA) parcel tax |
| Sea level rise | that prioritizes adaptation planning and project pre- | Continue targeted state support, possibly by focusing existing transportation planning funds, and seek to expand in the next business cycle through a state resiliency bond |
| | development | Expand federal funding through one or more existing pathways, possibly tied to an economic stimulus / green new deal package |
| Inland | Regional-scale support that prioritizes adaptation planning and project pre- development | Support existing local and regional special district pathways, such as the Sacramento-San Joaquin Drainage District or the new San Mateo County Flood and Sea Level Rise Resiliency District that would rely on property-related charges and benefit assessments, possibly combined with a jurisdiction-wide funding measure (e.g., parcel tax) |
| flooding | | Seek renewal of Integrated Regional Water Management Program (IRWMP) funding through a new state water or resiliency bond |
| | | Expand federal funding through one or more existing pathways, possibly tied to an economic stimulus / green new deal package |

Table 0.1. Climate adaptation responses that are priorities for additional funding

| Climate Risk | Priority Climate Adaptation Response | Potential Funding Pathways |
|---------------------------------------|---|--|
| | | A new source of ongoing funding for statewide scientific and technical work and regional collaboration, including modelling for riverine flooding under scenarios of increased winter rains |
| | Drought Improve the resilience of groundwater and surface water infrastructure | Initiate a new state water bond to extend funding for integrated regional water management planning and project implementation |
| Drought of grou surface infrast | | Substantially expand capital for the clean water and drinking water state revolving loan funds, and/or create a new revolving loan fund for dam safety that includes funding for dam removal |
| | | Develop a long-range strategy for amending Proposition 218 to allow lifeline and increasing block rate structures given that political support is currently lacking. |

Based on this gap analysis, we developed four funding pathways and refined them through research and interviews. We then tested the proposals by soliciting feedback from a wide range of stakeholders who would be in a position to implement them in interviews (Appendix B) and an online workshop with discussions organized around each funding pathway. We substantially revised the proposals in this report to reflect the comments and suggestions we received from a wide range of stakeholders with whom we tested the proposals.

The four proposed funding pathways are not intended to respond to the full range of climate change impacts California expects to face. Rather, they respond to some of the most significant climate adaptation needs and funding gaps and have a reasonable chance of implementation.

How the proposals address equity and disadvantaged communities

Throughout these four proposals, we have incorporated the concept of equity by considering how climate change impacts *and* the proposed funding pathways will affect lowincome households and disadvantaged communities. We have been guided by previous work on of equity in the AECOM and RLF report, *Paying for Climate Adaptation in California: A Primer for Practitioners,* and by the California State Integrated Climate Adaptation and Resiliency Program (ICARP) on climate vulnerability.

For each funding pathway, we discuss how low-income households and disadvantaged communities are affected by:

- <u>The distribution and scale of climate</u> <u>change impacts</u>: We consider the vulnerabilities of low-income households and disadvantaged communities to specific climate change impacts to ensure funding pathways address important equity issues.
- <u>The structure of the funding source</u>: Most state and nearly all local tax-based revenue sources are by nature regressive as they are based on consumption and represent a larger share of low-income households' disposable income. We specify some potential partial solutions, but a substantive solution would require a major revision of State law.

 <u>The distribution of the funded benefits</u>: Given the existing state and local tax structure, the most practical way of addressing social equity is through the distribution of funded benefits. We suggest strategies for designing pathways to improve equity through the distribution of benefits and reduction of unintended consequences that could increase inequities.

The State of California recognizes several designations of "disadvantaged community." Our use of the term in the proposals is intended to refer broadly to communities under any one of those definitions. We also refer to low-income households as they may live outside of designated disadvantaged communities and still be more vulnerable to climate impacts than wealthier neighbors. "Climate vulnerability describes the degree to which natural, built, and human systems are at risk of exposure to climate change impacts. Vulnerable communities experience heightened risk and increased sensitivity to climate change and have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts. These disproportionate effects are caused by physical (built and environmental), social, political, and/or economic factor(s), which are exacerbated by climate impacts. These factors include, but are not limited to, race, class, sexual orientation and identification, national origin, and income inequality."

Source: California Governor's Office pf Planning And Research, 2018, <u>Defining</u> <u>Vulnerable Communities In The Context Of</u> <u>Climate Adaptation</u>



Funding Pathway Proposal 1: Transportation Funding for Collaborative Adaptation Planning

Summary

This funding pathway would expand the existing Sustainable Transportation Planning Grant program to dedicate funds for collaborative regional transportation planning to adapt to sea level rise and other climate risks such as inland flooding and wildfire. Funding, estimated at \$10 million annually, would come from existing state and federal transportation planning sources or could come from expansion of the Federal Highway Administration (FHWA) State Planning and Research Program, possibly by leveraging the

Biden Administration's commitment to climate adaptation. The proposed program would support regional multi-stakeholder planning and decision making to adapt regionally significant transportation infrastructure to sea level rise. Funded projects would use the FHWA "Planning and Environmental Linkages" (PEL) approach that considers environmental, community, and economic goals early in the planning stage and is currently being employed to plan flood control/sea level rise improvements to Highway 37 in Sonoma and adjacent counties.

Climate Adaptation Challenge

Sea level rise poses an existential threat to transportation infrastructure of regional and statewide significance. Caltrans' recent vulnerability assessments identified sea level rise and related storm impacts as the costliest adaptation challenge for the Agency. The impact of sea level rise on transportation infrastructure is concentrated in a few Caltrans Districts. Over half of the miles of state highway vulnerable to sea level rise are in the San Francisco Bay area (Table 1.1).

| Caltrans District | Counties | Sea Level Rise (feet) | Exposur e (miles) (1) | Share |
|----------------------|---|-----------------------------|-----------------------------|-------|
| 1 | Del Norte, Humboldt, Mendocino | 4.60 | 33.57 | 16% |
| 4 | Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano Sonoma | 4.62 | 110.20 | 52% |
| 5 | Monterey, Santa Cruz, San Luis Obispo, Santa Barbara | 5.74 | 26.30 | 12% |
| 7 | Los Angeles, Ventura | 5.74 | 23.05 | 11% |
| 11 | San Diego | 5.74 | 7.81 | 4% |
| 12 | Orange | 5.74 | 12.90 | 6% |
| Total | | | 213.83 | 100% |

Table 1.1: State Highway System Sea Level Rise Vulnerability

(1) Includes impacts of 100-year storm surge and cliff retreat.

Sources: Caltrans & WSP, Caltrans Climate Change Vulnerability Assessments, 2018-2019 (separate report for each Caltrans district)

Adaptation responses include (1) building protection against the threat (defend), (2) redesigning the infrastructure (accommodate), or (3) abandoning and relocating (retreat). No one has fully estimated the economic cost associated with such fortification, alteration, or relocation of existing infrastructure, but it will be billions of dollars. Nonetheless, the costs of inaction significantly outweigh the costs of adaptation.

Adaptation planning for transportation infrastructure requires a collaborative, regional-level approach. Transportation infrastructure's design characteristics - linear infrastructure mostly at grade - make it central to regional adaptation efforts. Raising transportation infrastructure or retreating could limit neighboring communities' options for adapting to sea level rise. In its adaptation planning Caltrans has recognized the need to addresses impacts on surrounding communities, particularly vulnerable populations.¹ At the same time, making transportation infrastructure "the last line of defense" from sea level rise could generate substantial benefits for private property and public asset owners on the inland side. These co-benefits from transportation infrastructure

adaptation bring the potential for additional funding, thereby reducing demands on transportation funding sources for adaptation.

Given the long-time horizons for significant sea level rise impacts and the fact that these time horizons shorten with each successive climate assessment, the State needs to incentivize planning agencies at all levels to move to this next phase of adaptation as soon as possible. Developing public support for adoption of needed revenue streams will also require identifying the overall costs of adaptation. This phase should build on existing vulnerability assessments by identifying the benefits and costs of adaptation alternatives, and potential beneficiaries and revenue streams.

Climate Adaptation Funding <u>Gap</u>

We developed a statewide estimate of the sea level rise adaptation funding gap based on a 2020 report by the Metropolitan Transportation Commission, the regional transportation planning agency for the San Francisco Bay Area.² The report's cost and funding estimates are based on two feet of sea

¹ See also California Executive Order B-30-15 (April 29, 2015) and the resulting guidance document, Planning and Investing for a Resilient California: A Guidebook for State Agencies, Governor's Office of Planning and Research.

² Scenario for 2050 based on two feet of sea level rise plus one foot for annual storm surge and king tide events. See Association of Bay Area Governments and Metropolitan Transportation Commission, Plan Bay Area 2050 and Sea Level Rise Adaptation, September 23, 2020.

level rise by 2050. The report estimates adaptation costs of \$19 billion, offset by \$11 billion in revenue from existing state and federal sources for shoreline flood protection and resilient transportation projects, leaving an \$8 billion funding gap. Based on the Bay Area's share of statewide sea level rise vulnerability shown in Table 1.1, the statewide need would be \$37 billion by 2050 with a funding gap of \$15 billion. Assuming planning costs of 10% (before the design, environmental, and construction phases), adaptation planning will require \$3.7 billion by 2050, or \$123 million annually with an annual funding gap of \$50 million.

Senate Bill 1 (SB 1) adopted in 2017 is the primary legislation authorizing funding for transportation purposes in the state. The bill generates about \$50 billion for California's transportation over ten years from increases in fuel taxes, vehicle registration, and truck weight fees (roughly \$5 billion annually). In FY 2019-20, transportation planning funding in California was close to \$1 billion. Most of this funding is distributed by formula from federal sources to Caltrans, and then combined with state (SB 1) sources to regional transportation agencies³. Some funding is distributed by Caltrans through competitive grants to local and regional agencies.

SB 1 included \$20 million for an Adaptation Planning Grant (APG) program. Unfortunately, this program was tied to the State's General Fund repayment of borrowed funds and only lasted for three years through FY 2019-20. That funding represented the only dedicated source for regional transportation adaptation planning to date.

Currently, the only funding source that specifically includes climate adaptation planning in its eligibility criteria is the Sustainable Transportation Planning Grant Program, administered by Caltrans. Table 1.2 provides a description of the funding provided by the program. This program is extremely competitive, with over \$160 million in applications for \$34 million in funding.

| Program | Funding Source (1) | Eligible Applicants | Funding | Notes | Total Applications |
|---------------------------------------|--|--|-------------|--|-----------------------|
| Sustainable Communities Formula | Road Maintenance & Rehabilitation Account (RMRA) (state funding) | Regional transportation agencies | \$12.5 mil. | Distributed by formula primarily on population | NA |
| Sustainable Communities | State Highway Account (SHA) | Regional transportation | \$14 mil. | | |
| Competitive Grants | and RMRA (state funding) | agencies, cities, counties, tribal gov'ts | \$3 mil. | Technical studies; does not include climate adaptation | \$160 mil to |
| Stratogic | Federal Transit Administration (FTA) Section 5304 | Regional | \$3 mil. | Project must focus on transit | \$180 mil. |
| Partnerships | Federal Highway Administration (FHWA) State Planning & Research (SP&R) (25%) (2) | transportation agencies | \$1.5 mil. | | |
| Total | | | \$34 mil. | | |

Table 1.2: Caltrans Sustainable Transportation Planning Grant Program

(1) The Sustainable Communities Program formula and grants funding is supported by a \$25 million continuing authorization of the Road Repair and Accountability Act of 2017 (SB 1) (see Streets and Highways Code, section 2032(f)). The remaining \$4.5 million is allocated through the State Highway Account (SHA) (Streets and Highways Code, section 194), and the Public Transportation Account (PTA) (PUC Sec. 99311 and 99315). Strategic Partnerships funding all from federal sources.

(2) The other 75% of this FHA SP&R funding is used to support Caltrans planning staff.

Source: Caltrans, FY 2020-21 Grant Application Guide: Sustainable Communities and Strategic Partnerships, December 2020

In addition to this program, substantial state and federal funding for transportation planning is provided by formula to Caltrans and regional transportation agencies.⁴ Regional agencies receive substantially all of their ongoing funding for transportation planning from these sources. For example, the draft Metropolitan Transportation Commission (MTC, the San Francisco Bay Area's regional transportation agency) budget for FY 2020-21 included \$30 million in ongoing planning revenue from federal and state sources. This funding supports agency staff and outside professional services. It is flexible enough to be used for climate adaptation planning, though in stiff competition with more urgent needs.

Funding Pathway Description

This funding pathway would expand the existing Sustainable Transportation Planning Grant program and dedicate funding to collaborative regional transportation planning to adapt to sea level rise. We have modelled it after the prior Adaptation Planning Grant program. Funding would come from existing state and federal sources for transportation planning or from expansion of the FHWA State Planning & Research program (Table 1.2, above).

This new grant program would aim to identify effective planning approaches for multistakeholder climate adaptation planning and decision making associated with regionally significant transportation infrastructure. To attract additional federal funding, this new grant program would rely on the FHWA "Planning and Environmental Linkages" (PEL) approach that considers environmental, community, and economic goals early in the planning stage and carries them through project development, design, and construction.⁵ Caltrans currently use the PEL approach to plan flood control/sea level rise improvements to Highway 37 in Sonoma and adjacent counties.

This new grant program would prioritize project alternatives that generate co-benefits for a wide range of stakeholders, with a priority for disadvantaged communities and lowincome households. Supporting project alternatives that benefit a wide range of stakeholders will expand the funding options for implementing those projects.

This proposed new grant program is needed now because the impacts of sea level rise are already apparent, and the need will increase in the coming decades. Waiting until significant damage occurs from repeated flooding events will likely result in emergency-driven approaches and sub-optimal solutions. The planning and implementation of large transportation capital projects takes decades, and the multi-stakeholder process required to maximize co-benefits adds time to the process. Developing multi-stakeholder planning approaches now will support efficient use of public funds for adaptation of the State's transportation system.

Eligible grant recipients would include regional transportation agencies, cities, counties, and tribal governments. To be eligible for funding, the proposed project would be required to:

Focus on a study area that includes:

⁴ These federal funds include Section 5303, 5304, and 5305 funds from the Federal Transit Administration (FTA) and Metropolitan Planning (PL) funds from the Federal Highway Administration (FHA). State funding is from the Transportation Development Act (TDA) supported by a ¹/₄cent apportionment from the state sales tax through the Local Transportation Fund (LTF), and the state sales tax on diesel fuel through the State Transit Assistance (STA).

⁵ The PEL process represents a collaborative and integrated approach to transportation decision-making that 1) considers environmental, community, and economic goals early in the transportation planning process, and 2) uses the information, analysis, and products developed during planning to inform the environmental review process. See <u>https://www.environment.fhwa.dot.gov/env_initiatives/</u> PEL.aspx.

- A segment of the state or federal transportation highway or regional transit system vulnerable to sea level rise within a planning horizon of 2050 to 2080
- Areas with existing urban development surrounding the highway or transit segment that also are vulnerable to sea level rise within the same planning horizon, and that would be affected by adaptation scenarios implemented for the transportation system segment
- Disadvantaged communities comprising at least 50% of the study area
- Develop high-level ("sketch" or "planning" level) scenarios based on an adaptation pathways approach at sufficient detail to provide order-of-magnitude cost estimates and identify key community and environmental impacts
- Apply benefit-cost analysis to the adaptation scenarios considering full lifecycle costing and non-monetized impacts including socioeconomic impacts and impacts on ecosystem services
- Develop funding alternatives for each scenario that combine existing and/or propose new local, regional, state, and/or federal sources, and that explicitly consider equitable approaches to allocating the funding burden
 - Facilitate engagement of all affected public and private stakeholders throughout the planning process and use this engagement to identify preferred scenarios

Program funding would be \$10 million annually, which reflects prior APG program funding levels. Based on estimated costs of \$500,000 to \$2 mil. per project, funding at this level would support five to twenty grants annually with larger projects occurring over multiple years. Caltrans would administer the program.

Equity Analysis

Impact of climate change

Disadvantaged communities face larger economic challenges adapting to sea level rise due to lower household incomes and property values. These resource constraints make it more difficult for these communities to participate in planning efforts, generate local funding for adaptation measures, and retreat if necessary. Without a regional planning approach and explicit attention in program design to address these conditions, wealthier communities will have more resources and ability to adapt effectively, with potential to further widen existing inequities.

The structure of the funding source

State and federal gasoline taxes generate the vast majority of funding for transportation planning. As a tax on consumption, the burden is regressive because low-income households spend a larger percentage of their incomes on auto transportation than higher income households. This pathway proposes no additional funding sources so there would be no change in the current funding burden on low-income households.

The distribution of the funded benefits

Given the constraints disadvantaged communities face in adapting to sea level rise, at least 50% of each project study area would need to include disadvantaged communities. To provide equitable treatment for disadvantaged communities, the grant program would need to include specific requirements and financial support for community engagement. In addition, funding and financing plans to implement adaptation measures would need to prioritize equitable approaches to generating revenue and allocating funding so disadvantaged communities have meaningful opportunities for effective adaptation.

Implementation

Implementation requires:

- Identifying \$10 million annually to be reallocated from existing transportation planning funding sources, or expansion of the FHWA's SP&R program
- Determining whether adding this component to the Sustainable Transportation Planning Grant program can be done administratively or requires legislation action
- Clarifying grant objectives and selection criteria

Several factors influence the feasibility of this proposed funding pathway, including:

Funding authorization: Reallocation of existing funds faces competition from more immediate transportation planning priorities. The design of SB 1, the primary source of state funding for transportation planning, makes changes hard to enact even for a modest amount of funding. On the federal funding side, Caltrans could potentially leverage the Biden Administration's commitment to climate adaptation to expand federal funding for the FHWA SP&R program to support regional coastal sea level rise planning. The State of California could consider advocating for funding as part of a coalition of coastal states, particularly now that the east and gulf coast states are starting to experience the direct impact of sea level rise on their transportation infrastructure.

Statewide application: Although sea level rise is the most significant climate adaptation challenge Caltrans faces, focusing on it necessarily concentrates beneficiaries of the program to coastal areas and the San Francisco Bay, though other transportation assets along the coast would also be eligible. This focus may be too narrow to garner the political support necessary to authorize the program, particularly if legislative action is required. Alternatively, the program could expand to include transportation adaptation planning projects for inland areas such as adaptation to inland flooding from extreme precipitation events and improving evacuation routes in response to wildfires.



Funding Pathway Proposal 2: Extreme Heat Policy and Institutional Reform

Summary

This proposal would create a policy pathway to lay the groundwork for funding responses to extreme heat. This pathway would identify needed heat-related regulatory standards and establish a governance structure to implement and fund them through state and local governments. Rather than identify funding sources, this proposal identifies the policy priorities and tradeoffs policymakers will need to consider when designing extreme heat policies and funding sources.

Climate Adaptation Challenge

Extreme heat is responsible for more deaths in the United States than those from all other weather-related causes combined. Heat

https://www.treepeople.org/wp-

content/uploads/2020/09/RX-for-hot-cities-report.pdf. ⁷ Berkeley Center for Law, Energy & the Environment,

2020, Insuring Extreme Heat Risks, https://www.law.berkeley.edu/wp-

content/uploads/2020/11/Insuring-Extreme-Heat-Risks-Dec-2020.pdf impacts concentrate in cities as they are warming more quickly than non-urban areas.^{6,7} Studies link extreme heat to an increase in premature births, to reduced student learning and to greater racial educational disparities.^{8,9} High temperatures have also been linked to reductions in payroll of several percentage points.¹⁰

California is experiencing a higher number of extreme heat events due to climate change, and the frequency of extreme heat days will likely increase in the coming years. Adaptation responses to extreme heat include cooling buildings, increasing outdoor shade in built areas, outdoor work adaptations, and dedicated cooling centers.

Extreme heat affects all people, but can particularly harm children, the elderly,

https://scholar.harvard.edu/files/jisungpark/files/paper_____will we adapt park behrer.pdf.

⁶ Los Angele Urban Cooling Collaborative, 2020, Rx for Hot Cities: Climate Resilience Through Urban Greening and Cooling in Los Angeles,

⁸ Barreca and Schaller, 2020, "The impact of high ambient temperatures on delivery timing and gestational

lengths", Nature Climate Change v10 January 2020, https://doi.org/10.1038/s41558-019-0632-4. ⁹ R. Jisung Park et al., 2020, "Heat and Learning",

American Economic Journal: Economic Policy, v12 May 2020,

https://www.aeaweb.org/articles?id=10.1257/pol.201806 12&&from=f.

¹⁰ Jisung Park, Patrick Behrer. "Will We Adapt? Temperature Shocks, Labor and Adaptation to Climate Change." Harvard Project on Climate Agreements Working Papers, Submitted.

pregnant women, and anyone else with health conditions. Children and the elderly tend to spend more hours at home than adults of working age, heightening the need for cooling of residential buildings, especially multi-family residences.

Low-income households and disadvantaged communities tend to be more exposed to extreme heat. These populations are less likely to live in residences with air conditioning, are more likely to work outdoors or in workplaces without air conditioning, and are more likely to spend their time in public spaces lacking investment in shade structures, urban greening, or other outdoor cooling measures.

Climate Adaptation Funding Gap

Most experts interviewed felt that extreme heat is the climate adaptation response with the least attention and funding. There is general consensus that this is due to the fact that no one agency is responsible for addressing extreme heat and no statewide standards for maximum indoor temperatures have been set. The only extreme heat-related standard in California comes from CalOSHA and regulates outdoor workplace heat exposure.¹¹ CalOSHA is also developing standards for heat illness prevention in indoor workplaces.¹²

While adaptation to extreme heat in all contexts lacks sufficient funding and policy attention, a few priority near-term responses emerged from interviews with experts:

 Efforts to cool residential buildings, particularly multi-family residences, emerged as a top priority, given that people are exposed to extreme heat at home more than any other indoor setting.

- Schools also present an important opportunity to protect children's health and ability to learn.
- Other institutional settings with populations vulnerable to extreme heat include senior residential and nursing facilities and correctional facilities.
- Outdoor public spaces in cities. Cities experience higher heat levels than nearby rural areas due to the heat retention effects and density of buildings, roadways, and other urban infrastructure ("urban heat island" effect). Adaptation responses include urban forestry and transit shelters.
- Resilience hubs or resilience centers. Communities increasingly recognize the need to have public spaces ready to meet the needs of vulnerable community members not only during extreme heat days, but also during periods of high wildfire smoke and other forms of air pollution, and during public safety power shutoff events. These events in some cases overlap, supporting the argument for designated facilities that can meet multiple needs, including related to air conditioning, air purification and reliable electrical service.

Some state and federal programs provide assistance for cooling. These include the statefunded Low-Income Weatherization Program (LIWP), the federally funded (stateimplemented) Low Income Home Energy Assistance Program (LIHEAP) and the Department of Energy Weatherization Assistance Program (WAP). For schools, Proposition 39 paid for heating and cooling as well as related weatherization and energy

¹¹ Heat Illness Prevention Regulation Amendments California Code of Regulations, Title 8, Section 3395 https://www.dir.ca.gov/Title8/3395.html

¹² https://www.dir.ca.gov/dosh/doshreg/Heat-illnessprevention-indoors/

efficiency improvements.¹³ However, these programs do not have the resources to meet current demand for assistance. Prop. 39 funding has ended and funding for LIWP through the Greenhouse Gas Reduction Fund (GGRF) has declined; this year no GGRF funding was proposed for LIWP.¹⁴ The need for assistance with cooling will grow as the number of extreme heat events around the state continues to rise.

Setting policy for thresholds and establishing a coordinating body at the state level are necessary first steps to addressing and funding adaptation responses to extreme heat. AB 2441 (Rivas, 2019-20) ("the Rivas Bill") would have established the Strategic Growth Council as the coordinating body focused on outdoor and built environment solutions. While it did not pass, it provides the groundwork for future extreme heat policies and institutional arrangements.

Funding Pathway Description

The first step in creating a funding pathway to address extreme heat in California is to create a regulatory and institutional framework that sets and implements heat-related standards. This proposed pathway involves designing heat-related policies and standards, and creating an institutional framework through which funding can be raised and distributed.

Design of extreme heat policies – key decision points

Through interviews and a workshop-based consultation with representatives of state and local government, non-profit organizations, research institutions and consulting firms, we identified key questions to consider in the design of extreme heat policies. These include how to regulate heat, where to regulate heat, information generation and sharing, and linkages with other policy priorities. We explore options below, all of which would benefit from further assessment

How to regulate heat: performance standards or prescribed solutions

Regulatory changes to address extreme heat indoors could take two approaches: (1) set a performance standard in the form of maximum indoor temperature thresholds and enable private and public actors to identify the most efficient means of reaching them; and/or (2) prescribe specific types of solutions for buildings and outdoor spaces to reduce temperatures. In either case, policy makers may need to decide whether to focus on heat events that threaten life safety or broader thermal comfort standards that aim to address chronic health, learning, and earnings impacts.

Pursuing a performance standard requires statewide rules for maximum indoor temperatures. Currently these do not exist. Experts interviewed recommended that these temperature standards would need to vary by setting (e.g., residential, workplace, school, other institutions). Given that building standards exist at the state and local levels, heat thresholds would also need to be incorporated into city or county-level building standards and related regulations. This approach would pose foreseeable implementation and enforcement challenges.

Alternatively, prescribing types of solutions would involve incentivizing or mandating changes to the built environment to reduce temperatures. These would likely include building energy efficiency and weatherization, passive cooling design, and outdoor greening

¹³ Proposition 39 was approved by voters in 2012 to allocate revenue from the General Fund to schools to support energy efficiency, alternative energy projects, and related improvements through the 2017-2018 fiscal year. https://www.cde.ca.gov/ls/fa/ce/

¹⁴ CA Dept. of Community Services & Development funding for LIWP through the GGRF <u>has been declining</u> <u>since FY 2014-15 and was only \$10 mil. in FY 2019-20</u>. This fiscal year no GGRF funding was proposed for allocation to LIWP.

and shade structures. The 2020 Rivas Bill takes this approach. Outcomes could be measured in adoption of built environment solutions rather than in share of indoor settings staying under maximum temperature thresholds.

In either approach, policy makers would need to decide whether to set standards for new construction only or also require the retrofit of some or all existing buildings. While requirements to retrofit existing housing to meet cooling standards would represent an enormous undertaking in terms of costs and implementation, they could align with existing efforts to increase energy efficiency and building electrification. A compromise would be to require compliance with cooling standards whenever a modernization project is conducted, rather than across the board. The implementation of seismic standards for buildings in the 1990s sequenced compliance similarly.

Where to regulate heat: priority settings for extreme heat policies

Policymakers would need to decide the priority indoor and outdoor settings for applying extreme heat policies, and how to sequence the implementation of standards. For example, policy makers could require changes to residential standards first, given that is where vulnerable populations are likely to spend most of their time. Heat-related standards could then follow for schools, health facilities, indoor workplaces, and correctional institutions. The implementation of seismic standards provides a model for this approach.

In addition to indoor heat maximum thresholds, adaptation to outdoor extreme heat, especially in urban spaces, also calls for new policies. As temperatures rise, more public infrastructure will be needed to complement building cooling efforts and offset cooling technologies such as air conditioners that can contribute to the heating of outdoor spaces.

The 2019-20 Rivas Bill supported solutions to reduce urban heat island effects, including cool roofs, cool pavements, and reflective surface materials. Alternatively, performance standard-based approaches to reducing urban heat island effects could meet certain indicators, such as an acceptable length of non-shaded distance to reach public transportation. Additional research is also needed to understand and set target maximum temperature thresholds in a variety of settings.

How to generate and share data

Several interviewees mentioned the lack of data sharing and public communications about extreme heat as problems. This includes an absence of 1) standardized temperature measurements, even within the same county; 2) standards for when to send out extreme heat alerts; and 3) best practices for informing vulnerable populations of the locations of cooling centers and other assistance on extreme heat days.

How to align with related policy priorities

Many people interviewed emphasized the need to "mainstream" or integrate extreme heat policies across state and local-level policymaking. Given that extreme heat does not have a policy "home," it needs be integrated into regulatory and investment decisions across a range of departments and sectors. One mechanism is the Climate Investment Framework called for in the Governor of California's Executive Order N1919. The Framework provides a strategy for shifting state funds to investments that reduce carbon emission and adapt to the impacts of climate change.¹⁵ A similar mechanism is

¹⁵ https://www.gov.ca.gov/wpcontent/uploads/2019/06/6.18.19-Executive-Order.pdf

Executive Order B-30-15, which offers guidance on how to address climate in all State planning and investments.¹⁶ The below section on institutional frameworks discusses state agencies whose mandates are relevant to extreme heat are discussed.

Policies to address extreme heat should also align with ongoing efforts in California communities to create "resilience hubs,"¹⁷ which the Rivas Bill refers to as "community resilience center[s] to mitigate impacts of local climate risks." These hubs or centers can be a tool in local governments' responses to extreme heat as they are a means for increasing access to cool spaces during extreme heat events. They also provide cobenefits by providing refuge from wildfire smoke and high levels of air pollution.

Given the overlap between climate-related events (e.g., extreme heat, wildfire smoke and public safety power shutoffs), extreme heat performance standards should be integrated in the design of both resilience hubs and evacuation centers intended for multiple hazards. Resilience hubs would meet the need for a safe, cool, clean air space on a day-use basis, as opposed to evacuation centers that would house victims of wildfire, earthquakes, or other disasters that force residents out of their homes for multiple days or weeks. These services are complementary in that they both respond to climate change impacts and could benefit from being linked when seeking funding.

Institutional frameworks

No one government agency has the authority to regulate heat exposure across all settings. Implementation of extreme heat regulatory standards would require assistance from four types of state and local agencies. Table 2.1 provides an overview of the relevant state agencies.

- 1. Establishment of a coordinating body. Currently no state agency is tasked with implementing heat-related standards in multiple settings or connecting implementation to funding opportunities. Policy makers may choose to locate the coordinating authority outside of the agencies involved in regulating temperature thresholds and the agencies providing heat-related grant funding programs. Regardless of which agency is chosen as a coordinating body, it would need to have the authority to direct implementing agencies to adopt heatrelated standards, incentivize compliance through grants, and identify grant priorities. Preliminary options include:
 - The Strategic Growth Council (SGC): The 2019-20 Rivas Bill suggested the Strategic Growth Council as both a coordinating body and a grant-making body.
 - The Office of Policy Research (OPR): An updated draft bill by Assembly member Rivas may designate the Governor's Office of Policy and Research as the coordinating body.
 - Department of Public Health (CDPH): CDPH would provide the expertise in understanding the effects of extreme heat and prioritizing policy interventions.
- Agencies with regulatory authority over temperatures in one or more settings (residences, workplaces, schools, day care centers, correctional facilities and senior assisted living facilities). These agencies would likely be responsible for

¹⁶ https://opr.ca.gov/planning/icarp/resilient-ca.html

¹⁷ The Urban Sustainability Directors Network defines resilience hubs as "community-serving facilities augmented to support residents, coordinate

communication, distribute resources, and reduce carbon pollution while enhancing quality of life. <u>http://resilience-hub.org/</u>

implementing any standards related to indoor heat exposure enacted by the state legislature:¹⁸

- Regulations on Heat Exposure:
 - CalOSHA: Outdoor Heat Illness
 Prevention Standard; draft Indoor
 Heat Illness Prevention Standard.
 Regulates workplaces only.
 - Department of Public Health (CDPH): Important resource for identifying the impact of heat on public health, setting temperature thresholds, and setting standards for communicating extreme heat events and assistance to vulnerable communities.
 - Department of Social Services: Community Care Licensing Division requires indoor temperatures not to exceed 85F or over 20F degrees cooler than the outside temperature. Applies to day care centers and senior assisted living facilities.
- Building codes: California Building Standards Commission and the California Energy Commission have influence over building codes, including in residences, workplaces, schools, day care centers, correctional facilities and senior assisted living facilities. The CA Department of Education has influence over building codes for schools.
- Resilience Hubs/Centers: The Office of Emergency Services (OES) works with the emergency service coordinators for every California county to manage evacuations and disaster response. While resilience hubs would be designed to respond to needs that are

more short-term in nature (e.g., accessing cooling, electricity, and smoke-free area during the day) than evacuations from natural disasters, OES could provide guidance and support in their development.

- 3. Agencies with an ability to influence or fund measures to reduce heat (see Table 2.1). Several grant sources exist but their resources currently are orders of magnitude smaller than the amount needed to make meaningful changes to the built environment to reduce indoor and outdoor temperatures during extreme heat days. Options for increasing funding for extreme heat include:
 - Increase funding for existing grant programs, including through advocacy for greater federal government investment . The Biden administration's focus on vulnerable communities could provide an avenue for increasing funding in federal and state programs that support home weatherization, passive cooling, and urban greening.
 - Link cooling technologies to broader policy efforts to decarbonize buildings. Replacing gas-powered heating system with electric heat pump systems not only reduces fossil fuel use but also provides air conditioning through the same systems.
 - Expand utility-funded programs and/or prioritize existing funding to support indoor cooling and weatherization. These programs include:
 - Energy Savings Assistance Program (ESA)

¹⁸ DeShazo and Lim, 2020, "Measuring the Impacts of Climate Change on Vulnerable Communities to Design and Target Protective Policies", Community Advisory

Committee Meeting presentation, April 2020, UCLA Luskin Center for Innovation, Los Angeles.

- Disadvantaged Communities -Single-family Solar Homes (disadvantaged community-SASH)
- Solar on Multifamily Affordable Housing (SOMAH)
- Incentivize private property owners to adopt building cooling solutions. In addition to grant programs that provide direct support for building cooling solutions, financial incentives, permitting support and technical assistance for new construction and remodels would help increase private investment in passive cooling and other technologies designed to reduce indoor temperatures.
- Capture the value to utilities of passive cooling building designs by linking

them to utility infrastructure expenditures. Passive cooling design reduces peak energy demand during extreme heat days. We could foresee utilities supporting financially passive cooling building construction and retrofits If utilities considered passive cooling building investments as a form of infrastructure investment to meet peak electricity demand.

4. Local government agencies. At the county level, these could include county departments of public health, emergency services, housing, and sustainability. At the city level, these could include city departments of building, planning, housing, emergency management, and public health.

| State Agency | Cross-agency coordination | Research and guidance | Regulatory authority | Heat-related funding programs |
|---|---------------------------|-----------------------------|-------------------------|--|
| Board of State and Community Corrections | | | • | |
| Department of Aging | | | • | |
| Department of Community Services & Development | | | | Department of Energy Weatherization Assistance Program (DOE WAP) Low Income Home Energy Assistance Program (LIHEAP) Low-Income Weatherization Program (LIWP) |
| Department of Corrections and Rehabilitation | | | • | |
| Department of General Services, Building Standards Commission | | | • | |
| Department of General Services, Office of Public School Construction | | | • | School Facility Program Modernization Grants |
| Department of Education | | | • | |
| Department of Public Health | • | • | | |
| Department of Social Services, Community Care Licensing Division | | | • | |
| Division of Occupational Safety and Health (Cal/OSHA) | | | • | |
| Energy Commission | | | • | |
| Governor's Office of Planning and Research | • | • | | |
| Natural Resources Agency | • | | | Urban Greening Program Environmental, Enhancement & Mitigation Program CAL FIRE Urban and Community Forestry Grant Programs |
| Office of Emergency Services | | | • | |
| Strategic Growth Council | • | • | | |

Table 2.1. State agencies with roles related to extreme heat policy

Based in part on: DeShazo and Lim, 2020, "Measuring the Impacts of Climate Change on Vulnerable Communities to Design and Target Protective Policies", Community Advisory Committee Meeting presentation, April 2020, UCLA Luskin Center for Innovation, Los Angeles.

Equity Analysis

Given the vulnerability of low-income population and disadvantaged communities to extreme heat, representatives of these populations will need to participate in the design of policy and funding solutions so that the policies effectively meet their goals. Policy makers could apply an equity framework to the design of extreme heat policies to ensure resources deploy equitably to populations and communities that have experienced historical and ongoing disinvestment and have higher exposure to heat and other environmental impacts. Tools like the California Healthy Places Index can help quantify this framework.

Impact of climate change

Reducing the impact of extreme heat can improve social equity and advance environmental justice goals. Low-income households and communities of color tend to experience higher heat than other areas in the same municipality, due in part to substandard housing, community disinvestment and past redlining policies.¹⁹

The structure of the funding source

This pathway does not identify specific revenue sources, so a discussion of their impact on equity is premature. However, when designing revenue structures, it will be important not to favor sources that are regressive or that further burden low-income utility ratepayers.

The distribution of the funded benefits

Equitable design of the policies and eventual funding sources will need to focus on 1) how benefits are accessed and distributed, and 2) potential unintended policy consequences, particularly on the housing market. To meet the heat adaptation and resilience needs of the most vulnerable, program delivery will need to prioritize low-income households and disadvantaged communities. As with the proposed transportation planning funding pathway, funding sources will need to include specific requirements for engagement, including financial support for grant seeking. Funding could also incentivize local regulatory change to incorporate heat considerations into building codes.

However, new building standards and even community improvements could have unintended consequences for disadvantaged communities. New building standards can result in rent increases, further burdening lowincome families. The State Low-Income Weatherization Program (LIWP) reduces the risk of eviction in its multi-family residential programs primarily by working with deedrestricted affordable housing providers and by requiring all program recipients to guarantee 10 years of affordability (although compliance is not monitored). LIWP has also funded a new Community Solar Pilot, designed and built solely to benefit low-income households, which could help increase access to electricity for cooling.

As with impacts on multi-family housing, urban greening and other improvements to the built environment to reduce the urban heat island effect could increase property values and decrease the availability of affordable housing. This risk is inherent to any community improvements to adapt to climate change. It underscores the need to develop policies to set indoor heat thresholds and reduce the urban heat island effect in consultation with state agencies leading on related policy priorities, such as housing and public health.

https://www.nytimes.com/2020/09/30/climate/cityparks.html?smid=em-share

¹⁹

https://www.nytimes.com/interactive/2020/08/24/climat e/racism-redlining-cities-global-warming.html;

Community-based approaches to reducing indoor and outdoor temperatures could provide an opportunity for disadvantaged communities and low-income households to design solutions that preserve housing and neighborhood affordability by linking heat and housing policy. This could include community heat-mapping, in which residents identify areas within a neighborhood where temperatures are highest during extreme heat events. Several interviewees urged that funding sources be funneled through community groups, which some weatherization and energy efficiency assistance programs already do.

Implementation

Adaptation to extreme heat has begun to attract the attention of the state legislators and local governments. A coalition is needed to create the momentum needed to design policies that meaningfully reduce exposure to extreme heat and address the questions raised in this proposed pathway. The coalition would need to include state and local policy makers, environmental justice and workforce development advocates, and utility and industry experts, among others. This would involve, in the following sequence:

- Establish a task force on extreme heat that works with state legislators, city and county government leaders, environmental justice groups, traditional environmental groups, schools, labor unions, etc. to identify:
 - Knowledge needed to set thresholds in a variety of settings and recommend indoor heat thresholds
 - 2) Prioritization for funding where are regulations most needed? What do we fund first?

 Potential co-benefits, as a way of broadening support for extreme heat policy

Several interviewees suggested identifying members of this new task force by drawing on the work of the Climate Justice Working Group, which RLF supported in its development of a 2018 *Climate Justice Report* to inform the State of California's Fourth Climate Change Assessment²⁰

- Coordinate the efforts of legislators to bring extreme-heat legislation to the state legislature. Synchronize drafting legislation with related policies and experts, including affordable housing, community development, building standards, emergency services, schools/institutions.
- Identify an appropriate state-level coordinating agency.
- Review within agencies the policies and funding sources that could contribute to reducing indoor and outdoor temperatures (building standards, energy efficiency and weatherization programs for public and private buildings).

The feasibility of this funding pathway depends on the ability to create a coalition broad enough to capture the range of potential beneficiaries of an extreme heat policy (including health, workforce, and greenhouse gas emissions benefits) but narrowly focused enough to make extreme heat a policy priority.

²⁰ Climate Justice Report: https://resourceslegacvfund.org/wp-

content/uploads/2018/09/Climate-Justice-Report-4CCCA-v.4-00455673xA1C15.pdf



Funding Pathway Proposal 3: Resilience Financing Districts for Funding Climate Change Adaptation

Summary

This pathway would consolidate, and in some cases expand, all currently authorized local government powers needed for funding and financing climate change adaptation into a new special financing district: a Resilience Financing District (RFD). In nearly all cases, RFDs would not be new independent districts or separate public agencies, but instead would be formed and governed by an existing local agency and apply to a sub-area or all of the agency's jurisdiction (similar to existing financing district authorities in state law). RFDs can also be implemented by multiple jurisdictions through a joint powers authority ("JPA") to accommodate climate change responses on a regional basis. RFDs would apply revenues to a climate resilience problem as defined by the implementing jurisdiction.

Unlike many existing forms of special districts, RFDs would have the ability to fund capital projects *and* operating expenses.

Climate Adaptation Challenge

Local revenue generation will play a critical role in climate adaptation, as a match for

regional, state, and federal capital funds, for ongoing operations and maintenance (O&M), and to meet other local adaptation needs that cannot be funded out of existing resources. For example, the Federal Emergency Management Agency's (FEMA) new Building Resilient Infrastructure and Communities (BRIC) grant program requires a 25% local share. Where will the local share for BRIC come from, particularly when climate change adaptation projects scale up to the multi hundred-milliondollar range? This proposed funding pathway applies to the full range of climate adaptation responses, to be defined by the state legislation authorizing the creation of RFDs.

Funding for operation and maintenance ("O&M") expenses is another major climate adaptation challenge. Many climate adaptation responses now under consideration are not capital projects but comprise new and ongoing operational expenses. Existing statutory authority for new revenue through special districts is typically restricted to capital projects. This authority needs to be expanded to include O&M expenses for climate change adaptation.

Our workshops with State, regional and local government stakeholders on RFD's revealed a

consistent view that climate change adaptation responses cannot be solely "topdown." Local government is a key member of any team addressing a climate change adaptation challenge. Local government has control over land-use decisions. Local activists and voters can block projects, regardless of the sponsor. Federal grant programs typically require significant funding from local or regional government. All of these reasons drive a need for a for local and regional government revenue-generating and project management entity focused on climate change.

Interviewees and workshop participants emphasized the need for RFDs to have the flexibility to operate at different scales. Some RFDs need to be focused on relatively small projects within one jurisdiction. Other RFDs are needed for large-scale regional projects. Consequently, RFDs need to be statutorily enabled to operate effectively at both local and regional levels.

Climate Adaptation Funding Gap

Existing law in California provides for the formation of a variety of special financing districts, each specifically targeted to address particular infrastructure and O&M funding needs. (Infrastructure funding needs to be stable long-term revenue suitable for securing debt financing. Funding for O&M can be more volatile and does not absolutely need to be long term.) While cities, counties, other local governmental entities, and in some cases property owners can form financing districts, State statutes generally require that new revenues receive approval from property owners or registered voters within a district. Authorizing RFDs would allow one district to do both "special benefit" and "general benefit" projects under state law.²¹ This would increase both the efficiency and flexibility of local government in addressing climate change. At present, no one special district has the authorization to do both special benefit and general benefit projects and services. The general benefit projects authorized for Community Facilities Districts (CFDs) can include special benefit projects but require a two-thirds vote for approval as opposed to a simple majority for special benefit projects. As a result, local governments need to set up separate special districts to deal with what may be perceived as a single public policy challenge. This is particularly important for climate change adaptation responses, which can result in co-benefits by addressing multiple climate impacts. If RFDs were authorized, multiple public agencies could join together through a JPA to form a single RFD to address regional-scale climate adaptation challenges.

To fund both capital and operating costs for climate adaptation, RFDs would combine the powers of Geologic Hazard Abatement Districts ("GHADs"), Community Facilities Districts ("CFDs"), Enhanced Infrastructure Financing Districts ("EIFDs") and Fire Suppression Districts ("FSDs"). Existing special districts are each too limited in scope to support the range of climate adaptation capital projects and O&M funding needed to respond to wildfire, sea level rise, inland flooding, extreme heat, and drought. They also individually do not include the range of revenue sources and financing tools needed to enable local stakeholders to design districts that fit their specific needs or to implement socially equitable taxes and assessments. GHADs can

a particular legal parcel, such as the construction of a sidewalk in front of a home. A general benefit project or service benefits multiple parcels in a neighborhood or community, such as a new freeway interchange or elementary school.

²¹ The distinction under California law between general benefit and special benefit is critical to determining how local government can levy exactions to pay for capital or operating expenses. Special benefit projects or services specially benefit

only do a limited number of special benefit projects. CFDs have broad powers to do general benefit projects. Table 3.1 summarizes the current powers of FAD's, GHADs, CFDs and EIFDs. Each district as distinct limitations on its source of funding, eligible uses, and governance.

| | | 01 | | |
|---|------------------------------------|---|---|---|
| Authority | Fire Suppression District (FAD) | Geologic Hazard Abatement District (GHAD) | Community Facilities District (CFD) | Enhanced Infrastructure Financing District (EIFD) |
| Revenue | Special assessment | Special assessment | Special tax | Property tax increment |
| Improvements: Special vs. General Benefit | Special benefit only | Special benefit only | General and special benefits | General and special benefit |
| Governing Board | Forming jurisdiction only | Property-owners or forming jurisdiction | Forming jurisdiction only | JPA of forming jurisdictions |
| O & M Funding | Limited by authorizing statute | Limited by authorizing statute | Limited by authorizing statute | No. However, conflicting opinions amongst professionals |
| Capital Funding & Bonding | No | Yes | Yes | Yes |
| Broad Climate Adaptation Funding Authority | No | No | No | Yes, per AB 733 in 2017 |
| Eminent Domain | No | Limited to site acquisition for public improvements | Limited to site acquisition for public improvements, actual power retained by sponsoring public agency | Eminent domain power held by entity forming EIFD. |
| Community Engagement Funding | No | No | No | No |
| Public-private partnership Projects | No | No | Only through public facilities funding | Only through public facilities funding |
| Social Equity/disadvantaged community/low-income household Funding | No | No | No | No |

Table 3.1. Existing powers of climate-relevant special districts

Funding Pathway Description

Table 3.2 summarizes the powers we propose policymakers assign to an RFD that clearly represent no expansion of existing powers already possessed by local government. In this respect, an RFD would serve solely to consolidate and make more efficient the exercise of all of these existing powers. An RFD would comprise all of the powers of FAD's, GHADs, CFDs and EIFDs, plus broad authority to address the widest possible variety of climate change adaptation projects and programs, for both capital projects and operational funding.

| Power | Benefit of Power | Represents a major extension of existing State law? |
|---|--|---|
| Legal definition of authorized projects | Both special benefit and general benefit | No, both legal types of projects can be done. This would require different tax/assessment authorization processes. |
| Broad definition of authorized projects | District can respond effectively to fire risk, sea level rise risk, flood risk, and other climate-related risks | No. This is just a centralization of existing authorizations now spread through different public entities. |
| Operational funding | Broad operational funding authority to support any authorized project or service | No. So long as the appropriate process for levying the special tax or assessment is followed. |
| Capital funding | Broad authorization to fund capital projects | No. All authorized projects are already authorized for one or more other public entities. |
| Property-owner or resident controlled board | To raise funds and spend them locally with confidence, some voters may require a property-owner board | No. GHADs and many other special districts have this power. |
| Tax increment funding | Would give entity creating Resilience Financing District the ability to "match" local taxes/assessments with property tax increment | No. Just an application of EIFD powers to a new Resilience Financing District. |

| Table 3.2. Features of a Climate Resilience District with | No Expansion of Existing Power |
|---|--------------------------------|
|---|--------------------------------|

Consolidation of Existing Powers, Expansion of New Powers

Table 3.3 shows the features of an RFD that could be considered an expansion of existing powers currently retained by the four types of special districts identified in Table 3.1. The State legislature can gran these expanded powers to local government without either a constitutional amendment or Statewide ballot measure, primarily because they comprise powers formerly authorized for redevelopment agencies. However, the power to set aside and disburse funding for social equity purposes likely qualifies as a significant change in current State financial practices.

California's redevelopment law provided for an allocation of 20% of the property tax

increment from redevelopment project areas to provide funding for low- and moderateincome housing. We propose to use that approach to require an allocation of at least 20% of the property tax, sales tax, and TOT increment for social equity purposes. This allocation would be mandated for any RFD using EIFD powers. We have not identified what those purposes would be, but there are many strong candidates for use of such an allocation, particularly to offset special assessments and taxes in disadvantaged communities imposed by the RFD. Other potential uses of this funding include direct interventions for low-income households for extreme heat mitigation, or for wildland-urban interface (WUI) fire risk mitigation at the parcel level.

| Power | Benefit of Power | Represents a major extension of existing State law? |
|--|---|---|
| Direct funding of private projects as part of public-private partnership | Public-private partnership projects can be a financial engine for funding climate change adaptation projects, particularly for SLR | Yes. While former redevelopment agencies used to have this power, cities and counties at present do not |
| EIFD revenue expanded to include sales tax and TOT | Makes EIFDs an even more powerful tool for addressing climate change adaptation, particularly in SLR areas | Yes. While former redevelopment agencies used to have this power, cities and counties at present do not |
| Community engagement funding | Sustainable ongoing community engagement is a significant operational expense | Yes. Existing State law is at best unclear on the ability of local government to provide a stipend to community groups and members for community engagement |
| Disadvantaged community and low-income household intervention funding | Require RFD special taxes to offset the financial burden on disadvantaged communities from special assessments and special taxes imposed by the RFD | Somewhat. Many local parcel tax measures include exemptions for low- income property owners but there is no requirement in special assessment or tax authorities to address the unfair burden on low-income property owners and renters |
| Redevelopment powers, such as eminent domain | Broad use of eminent domain to accomplish climate change projects. Example: public-private partnership projects often require eminent domain for site assembly for private projects | Yes. While former redevelopment agencies used to have this power, cities and counties at present do not |
| Sales Tax Increment and TOT increment | Significantly increases revenue available for both major projects and public-private partnership projects | Yes. But these powers were given to redevelopment agencies in the 1980's, and later withdrawn. |
| Authorization to use RFD funds to either purchase, reserve for or otherwise augment fire insurance for privately owned properties within the RFD | Insurance professionals in California are concerned that the entire framework for fire insurance in the State may need to be redesigned in order to provide sustainable long- term coverage for properties in the WUI | Yes. This expansion would broaden the defined private projects to include the purchase or otherwise funding of insurance. |

Table 3.3. Features of a Resilience Financing District with Expansion of Existing Powers

Funding insurance costs and reserves as an operational expense. Casualty insurance professionals in both the private sector and the public sector have expressed growing concern that community scale wildfire risk mitigation measures will be needed to stabilize insurance premiums in the WUI. This mitigation may need to include direct intervention in the insurance market through community or regional scale loss reserves or reinsurance provisions. Accordingly, we recommend that the powers of an RFD be expanded beyond powers currently available to any special district to allow direct intervention by an RFD in the insurance market. Specifically, we recommend including authorization for RFDs to (1) directly fund WUI fire risk mitigation, (2) either directly purchase reinsurance or direct overage, and (3) fund special insurance loss reserves for losses from wind-driven wildfires. **Requirements for Using Expanded Powers.**

Table 3.4 below shows the linkages between the extra powers granted in Table 3.3 and the new responsibilities mandated to use these extra powers. The other expanded powers are tied to (1) making an allocation to a special fund for social equity and (2) certain community engagement requirements.

| Additional Power for RFDs | Allocation of revenue to disadvantaged community/low- income households Intervention Fund | Community Engagement |
|-----------------------------|---|----------------------|
| Sales tax and TOT increment | Х | |
| Eminent domain for public- | | |
| private partnership | Х | х |
| Broad operational funding | | |
| authorization | | х |
| Locally controlled board | | Х |
| WUI/SLR Insurance Funding | Х | х |

Table 3.4. Benefit Requirements Linked to Grants of Additional Powers

Governance and Use of Funds

We propose that RFDs be given the widest possible latitude to fund both capital projects and operating costs for climate change adaptation. Box 3.1 presents examples of potential projects. While AB 733 (2017) authorizes EIFDs to finance climate change adaptation projects, it specifically prohibits the use of EIFD funds for operations and maintenance or services. We propose that the EIFD powers be broadened to include funding for O&M, as is the case now with CFDs. GHADs have the ability either to be governed by the public entity creating them, or once formed, to have their own board elected by parcel owners. Our proposal for RFDs would retain this flexibility.

The use of special districts to address funding gaps in California raises the concern that government authority is being bifurcated through multiple special districts. The RFD concept partially addresses the issue of bifurcation of governmental authority by consolidating the powers of GHADs, CFDs and EIFDs into one new special district. As with a GHAD, RFD self-governance can be determined after the district is formed. The decision to allow self-governance must be made by an existing public entity forming a RFD. While CFDs can be formed by a wide variety of public entities, formation of a RFD could be restricted to cities and counties and certain special districts with elected boards. Situations in which a city or county would want to provide for self- governance by a RFD include when the

climate risk being addressed is very geographically specific, and adaptation requires active long-term engagement by the impacted community.

Box 3.1 Hypothetical Examples of Potential Projects

Public-private partnership for SLR mitigation in San Francisco Bay. A project to provide SLR protection for San Francisco Bay results in some developed areas being abandoned through managed retreat and new areas being reclaimed and developed through public-private partnership. The use of EIFD revenues and eminent domain triggers an obligation for social equity funding and community engagement. Through this process, a number of measures are identified to mitigate against gentrification and provide SLR protection for disadvantaged communities. The public-private partnership development provides not only a significant share of funding for the core SLR project, but funding for social equity programs and capital facilities for disadvantaged communities

Community scale fire risk mitigation and reinsurance in WUI. A community of 5,000+ people in California's WUI uses the various powers of an RFD to accomplish the following:

- Fund annual fire risk mitigation work in neighboring wildlands
- Purchase reinsurance for wind driven wildfire risk for all structures located within the RFD boundaries, which enables primary carriers to continue to provide coverage to those structures
- Provide funding/financing for fire risk mitigation improvements to individual privately owned structures, such as now done through PACE programs.

Social equity funding in disadvantaged community. A portion of the EIFD revenues from various RFDs within a regional government's jurisdiction are directly allocated to a social equity fund managed by the regional government. These funds are allocated by the regional government to social equity projects within disadvantaged communities in their jurisdiction that promote resilience.

Community engagement funding in disadvantaged community. A portion of the revenues generated by an RFD are used to fund long term community engagement within a disadvantaged community.

Stormwater recapture on community scale. An urban area facing climate change related water supply issues uses the various powers of an RFD to fund stormwater recapture improvements on a parcel - by - parcel basis, similar to a GHAD or PACE program.

SLR project financing and long- term maintenance. An RFD located in a SLR area gets voter approval to tax or assess for public facilities to protect against SLR. The projected constructed comprises a "living levee" which requires significant annual maintenance. The taxes or assessments authorized by the voters of the RFD can also be legally used to fund this maintenance. An extensive community engagement process to design the ultimate project was funded by a smaller voter approved tax or assessment by the RFD

Expanded Powers That Could be Politically Contentious

Five of the expanded powers for RFDs could be politically contentious and would need to be

accounted for in any legislative effort to establish RFDs. They are:

Eminent domain. The power of eminent domain raises major governance and equity

issues. Site assembly for a P3 real estate project often requires the use of eminent domain. The challenge is that while the power of eminent domain is crucial for public-private partnerships, that power raises serious concerns with both elected officials and the public at large. Consequently, we recommend that the use of eminent domain on behalf of private sector partners be clearly restricted to bona fide climate change adaptation projects, as defined by the proposed authorizing statute. If the authorizing legislation for RFDs were to include the power of eminent domain, its application for public-private partnership would be needed to meet clearly defined climate change adaptation needs. For example, the authorizing legislation could provide that all tax revenue from a publicprivate partnership project that required eminent domain be used exclusively to fund public sector climate adaptation projects.

Voluntary commitment of property tax increment to an EIFD. While it can be argued

that climate change is such an emergency that the involuntary commitment of property tax increment is justified, as was the case with redevelopment agencies, we believe that RFDs can be successful relying solely on a voluntary commitment of property tax increment. This is currently how tax increment is allocated for EIFDs. We also recommend RFDs provide that cities and counties can voluntarily commit their sales tax and transient occupancy tax revenues ("TOT") to EIFDs. Such a revenue commitment power can be very helpful in real estate P3's addressing climate change adaptation.

Local governance. Expansion of the local governance features of a GHAD to RFDs could result in another bifurcation of local government. However, practitioners of community engagement regarding climate change adaptation projects often observe that community members do not trust that their tax revenues will be spent locally on projects that benefit them. This may be particularly

true for disadvantaged communities. Consequently, based on these observations, it seems appropriate to give the jurisdictions that have the power to form RFDs the power, in their sole discretion, to also provide for local governance of an RFD.

Power to intervene in insurance market. At

present local and regional government in California has the power to mitigate fire and flood risks but may only intervene in the insurance markets with respect to their own properties and facilities. The power to enable local and regional government to intervene in the insurance market on behalf of private property owners is a significant expansion of power. This expansion of power could be opposed by the State Department of Insurance (DOI). The argument for allowing this expansion is that fire and flood risks differ significantly by both region and locality. Interventions consequently may need to be done at a more "granular" level than statewide to be effective. One potential compromise would be to require such interventions by an RFD to have approval from DOI.

Mandate to use a percentage of EIFD revenues to advance social equity goals. At

present, revenues allocated to an EIFD are not required to be used for efforts to achieve social equity goals. Furthermore, the housing setaside mandate under California's redevelopment law prior to the 2011 dissolution was generally resented by redevelopment agencies, and funds were not consistently applied to affordable housing projects. Nevertheless, the only other realistic alternative we see for social equity funding for climate change adaptation projects would be to authorize local governments to levy a surcharge on the State income tax. We believe that the State income tax is the only truly progressive tax authorization in California. Compared with such a local income tax authorization, we see a mandated percentage of EIFD revenues for RFDs going to social equity purposes as much more politically

feasible. In effect, if tax funding for climate change adaptation cannot practically be done on a socially equitable basis, then the expenditures for climate change adaptation need to be done on a socially equitable basis. This approach also aligns with the Biden administration's "Justice40 Initiative," which aims for 40% of the overall benefits of certain Federal investments to flow to disadvantaged communities.²²

Equity Analysis

Impact of climate change

Numerous disadvantaged communities are located in both the WUI and in areas likely to be impacted by sea level rise. At present, these disadvantaged communities have limited ability to fund climate change adaptation projects. The proposed RFD designation would provide disadvantaged communities with a new tool to address a range of climate related impacts, including flood protections, built environment hardening against wildfire, indoor and outdoor cooling infrastructure, and resilience hubs. For example, the disadvantaged communities that front on San Francisco Bay, such as North Richmond, West Oakland and East Palo Alto do not have the tax base to support the hundreds of millions in potential costs for sea level rise adaptation projects. Within California's WUI on the west slope of the Sierra Nevada, numerous small rural communities with a high percentage of the population on fixed incomes do not have the tax base to fund the costs of expanded fire risk mitigation.

The structure of the funding source

None of the assessment or taxing power authorized for the four types of existing special districts that are identified as components for RFDs are socially equitable. (CFDs in theory have the legal flexibility to address socially equitable tax structures, but the logistical challenges of doing so on a parcel-by-parcel basis are huge.)

In our opinion, the tax and assessment powers available to local government are not socially equitable. They simply are not tied to household income levels. The CFD authorizing statutes come closest. Some localities have used their inherent flexibility to allow owners of a particular parcel to voluntarily submit income information to the local entity that will enable the locality to give them a reduction or an exemption from a tax. However, this is at best a cumbersome process with inconsistent application. The State constitution provides that a true income tax can only be levied by the State.

Equity is simply not accounted for in the traditional California assessment district "benefit spread" used by GHADs. Equity can be improved through the flexible parcel tax structures allowed under a CFD rate and method of apportionment (RMA). A CFD RMA is limited only by two factors: (1) it cannot be *ad valorem* and (2) it must use metrics that can be accurately assigned to each parcel within the CFD. The metrics by parcel limitation is significant. Many metrics, such as income or other demographic data are difficult to assign accurately to a given parcel for an entire annual property tax cycle.

The distribution of the funded benefits

Equity is simply not a legal basis for allocating project costs by parcel for the traditional California assessment districts. In our opinion, none of the assessment or tax powers currently authorized for local government in California are inherently socially equitable. Given this, the most effective way of creating social equity in the funding of climate change

²² https://www.whitehouse.gov/briefingroom/presidential-actions/2021/01/27/executive-orderon-tackling-the-climate-crisis-at-home-and-abroad/

adaptation projects is through expenditures instead of exactions. We propose a "Disadvantaged Community/Low-Income Household Intervention Fund," which would receive a share of EIFD revenues allocated by statutory mandate. We have modelled this fund on the "housing set-aside" mechanism mandated for property tax increment for redevelopment agencies prior to dissolution. A major flaw with the prior redevelopment authorization was the unwillingness of some redevelopment agencies to spend that money. Any RFD legislation for a mandated allocation for social equity should either have a "use it or lose it" provision or direct such revenue to a fund managed by the regional council of governments or a statewide fund.

The Disadvantaged Community/Low-Income Household Intervention Fund could be used in the following ways:

- Additional funding for climate change related projects or operations for disadvantaged communities within the EIFD
- Additional funding for climate change related projects or operations for disadvantaged communities elsewhere in the region or the State, at the direction of either a council of governments or the State
- Funding for programs to mitigate the gentrification impacts of any publicprivate partnership project
- Direct intervention to support low-income households with climate change adaptation costs at the household level

Implementation

The feasibility of implementing the RFD concept depends on how ambitious it aims to be. Sufficient support likely exists today for legislation that solely consolidates existing powers into one new district. However, the feedback we received through the interview process with public agencies at the local and regional levels emphasized the need for the expanded powers described in this proposal. We consider it feasible to create RFDs with expanded powers. While these powers are expansions of current authority given to local agencies and regional government, all of them exist in state statutes, as they were given to redevelopment agencies in one form or another prior to dissolution.

In particular, we recommend that the following issues receive special attention by a stakeholder working group or task force:

- A clear definition of climate change adaptation projects that would qualify for the use of eminent domain for private projects would be allowed
- The level of mandated allocation for social equity funding, and the definition of eligible social equity purposes
- Allowable interventions in the homeowner's insurance market, and the DOI approval process for such interventions

The "re-authorization" of these powers back to local agencies will require careful consensus building and legislative drafting. Accordingly, we recommend that supporters of this funding pathway form a stakeholder group to negotiate the details of the potential expanded powers for RFDs. Communities of support for this funding pathway could be drawn from include:

- Cities and counties in WUI or SLR zones
- Regional government and local government in WUI or SLR zones
- Property and casualty insurance industry serving the WUI or SLR zones
- Segments of the real estate industry serving the WUI or SLR zones
- Utilities in WUI or SLR zones

Major landowners in WUI or SLR zones

Workshop participants advised further vetting the RFD concept through case studies. Case studies of ongoing planning and community engagement would test the feasibility of an RFD to address funding and governance issues for a particular type of climate adaptation project in a specific locality or region. In this way, multiple stakeholders would review the potential legislation from the standpoint of whether it would actually benefit a specific real-world challenge. Below are four candidates for case studies:

- North Richmond Living Levee Group
- Dumbarton Bridge West Approach and Adjacent Communities
- Highway 37
- Recovery of Town of Paradise



Funding Pathway Proposal 4: Wildfire Risk Reduction

Summary

This funding pathway would generate an estimated \$514 million annually through (1) a small surcharge on all property and casualty insurance premiums statewide, and (2) a higher surcharge on specified insurance lines with a nexus to wildfire risk on properties within the wildland-urban interface (WUI) (see Table 4.2). Metrics for program evaluation would include reduced loss of life and property from wildfires and reliable, available, and affordable property insurance in the wildlandurban interface (WUI). This pathway addresses social equity by focusing expenditures on disadvantaged communities and using a progressive tax structure. This pathway also includes private philanthropy support for adoption of regional funding measures.

Climate Adaptation Challenge

The incidence of catastrophic wildfires and the associated loss of lives and property is increasing and is likely to continue under the influence of climate change. Over the past decade, 11.8 million acres have burned, representing over 11% of the state, over 51,000 structures have been damaged or destroyed, and 197 lives have been lost. The 2020 fire season is the largest on record with over 4 million acres burned. Fifteen of the state's most destructive wildfires over the past century have occurred within the past 20 years, and 10 since 2015.²³

These trends will likely continue based on California's most recent climate change assessment.²⁴ Under a business-as-usual scenario for growth in greenhouse gas emissions (RCP 8.5), the average annual area burned by wildfires will increase 77% by 2100, with extreme wildfire events greater than 25,000 acres occurring 50% more often.

Catastrophic wildfires have statewide impacts that extend far beyond the WUI. A substantial share of the state's population suffers from poor air quality for weeks of high wildfire activity. A single fire, the 2018 Camp Fire, generated smoke for 13 days that affected 60 percent of the state's population.²⁵ Fifty million residents across California, Oregon, and

Assessment: Projecting Changes in Extreme Wildfire Events with a Warming Climate", August 2018.

²⁵ Los Angeles Times, "How Bad Is That Wildfire Smoke to Our Long-Term Health?", September 19, 2020.

²³ Governor Newsom's Strike Force, Wildfires and Climate Change: California's Energy Future, April 12, 2019.

²⁴ Westerling, Anthony Leroy (UC Merced), "Wildfire Simulations for California's Fourth Climate Change

Washington live in counties that experienced at least one day of unhealthy air quality during the 2020 wildfire fire season.²⁶ State highway closures during wildfires also have affects beyond the fire perimeter by putting significant constraints on travel for large areas.

This funding pathway focuses on wildfire risk reduction rather than fire suppression and disaster recovery. Risk reduction requires spending money now to reduce the risk and cost of future wildfire events. As risk reduction benefits are far less visible to the public, it can be difficult to generate support for this adaptation approach and therefore it can face the largest funding gap. Despite this, risk reduction generates substantial net benefits. The National Institute of Building Sciences' exhaustive 2019 national benefit-cost analysis of natural hazard mitigation found that building hardening and defensible space has a 2:1 to 4:1 benefit cost ratio.²⁷

<u>State Wildfire Risk Reduction</u> <u>Funding Gap</u>

The State's funding gap for wildfire risk reduction strategies is currently estimated at \$630 million annually based on \$830 million in total costs and a continuation of \$200 million in funding from the Greenhouse Gas Reduction Fund (GGRF) (Table 4.1). This order-ofmagnitude estimate is an initial attempt to identify the full cost of adequate wildfire risk reduction for the entire state, including costs for private property owners, local/regional agencies, and the State. This estimate excludes two substantial cost items: (1) hardening of community infrastructure such as utility systems, and (2) federal costs for vegetation management on federally owned forests, which comprise 58% of California's forests.

| | | Ų | | U U | | 1 1 1 |
|---|----------------------------|---------------------------------|---------------------|-------------------------|----------------|-----------------------------------|
| Risk Reduction Strategy | Primary Responsibility | Dwelling Units (DU) or Acres | Average Cost | Total Cost (\$ mil.) | State Share | Annual State Cost (\$ mil.) |
| Home Hardening & Defensible Space (2) | Property Owners | 2.0 mil. DU | \$15,000 per DU | \$30,000 | 10% | \$186 |
| Community Resilience (3) | Local/Regional Agencies | 4.7 mil. DU | \$100 per DU | \$470 | 20% | \$94 |
| Landscape-scale Vegetation Management and Ignition Prevention (4) | State | 200,000 acres | \$2,000 per acre | \$400 | 100% | \$400 |
| Reinsurance (5) | State | 4.7 mil. DU | \$32 per DU | \$150 | 100% | \$150 |
| Total State Share | | | | | | \$830 |
| Current State Ongoing Fundir | ng (6) | | | | | \$200 |
| State Funding Gap | | | | | | \$630 |

Table 4.1: State Wildfire Risk Reduction Funding Gap (order of magnitude estimates) (1)

(1) Does not include substantial costs for 1) hardening of community infrastructure such as utility systems, and 2) federal costs for vegetation management on federally owned forests.

(2) Estimate of total costs based on Governor's "Wildfire and Forest Resilience Funding Proposal FY 2020 – FY 2022". State share assumed by author. Annual cost assumes state share bonded at 2.1% rate, 30-year term, and 0.5% issuance cost.

(3) Assume 33% of state's 14.3 mil. dwelling units are in WUI including interface and intermix (see Martinuzzi, S., et al, *The 2010 Wildland-Urban Interface of the Conterminous United States*, U.S. Forest Service, 2015). Average cost estimate by author based on sample of regional fire prevention parcel taxes and benefit assessments.

(4) Based on Governor's "Wildfire and Forest Resilience Funding Proposal FY 2020 – FY 2022". Average cost per acre rounded up from \$1,842/acre (600,000 acres at \$1,143 mil. total budget minus \$38 mil. for community and home hardening).

(5) Average cost estimate by author based on 2.5% of \$1,280 average homeowner property insurance premium.

(6) Assumes ongoing funding from Greenhouse Gas Reduction Fund, similar to current levels.

Experienced Dangerous Air Quality Due To Wildfires This Year", September 23, 2020.

²⁷ National Institute of Building Sciences, *Natural Hazard Mitigation Saves*, December 2019.

²⁶National Public Radio, "1 In 7 Americans Have

The risk reduction strategies identified in Table 4.1 are structured around a coherent set of actions and a common set of entities responsible for implementation. The result is a geographic focus for each strategy, from the local to the state level, with an estimate of the State's cost responsibility at each level. Design criteria used to develop the State's cost share include:

- Incentivize the generation of local funding and the creation of local/regional public entities to coordinate appropriate risk reduction activities in each fireshed
- Return a portion of new state funding back to communities to build support
- Ensure that WUI property owners bear a fair share of the funding burden
- Address social equity impacts primarily on low-income property owners in the WUI

Costs are expressed as an annual obligation because, besides home hardening, nearly all costs are related to ongoing vegetation management and maintaining healthy forests. Strategies include:

- Home Hardening and Defensible Space. This is by far the largest total cost component (\$30 billion) and will primarily be the responsibility of property owners. The State could provide subsidies to incentivize private investment and offset the burden on low-income owners.
- Community Resilience. These are activities led by local/regional agencies such as ignition prevention/detection, vegetation management, grants management, and public education. The State could incentivize regional revenue measures to fund these efforts and offset burdens on disadvantaged communities with a

formula rather than grant subvention program.

- Landscape-scale Vegetation Management and Ignition Prevention. Healthy and resilient forests have been the primary focus of state programs to date. Costs include fostering biomass markets and investing in workforce development. The State should supplement these efforts with funding for large-scale ignition prevention/detection (e.g., hardening state highways) in chapparal and grassland environments that predominate in Southern California.
- *Reinsurance*. Publicly funded reinsurance may be needed to support affordable property insurance in the WUI, at least for the catastrophic wind-driven wildfire risk. The WUI property insurance market is currently in flux so the need for and cost of this activity will require further refinement.

Land use regulations to limit development in the WUI and incentivize relocation for the highest risk properties would be a complementary strategy to those in Table 4.1. Table 4.1 does not include this additional strategy only it does not require significant public funding to implement. Furthermore, this funding pathway, both the non-state revenue indicated in Table 4.1 and the state funding discussed in the next section, is designed to impose the costs of risk reduction directly on those that benefit in the WUI, creating price signals to appropriately disincentivize WUI development.

No risk reduction efforts can eliminate all risk. The appropriate public policy objective is to reduce risk to a reasonable level given available resources. Metrics for program evaluation would include reduced loss of life

²⁸ Insurance losses in the state from wildfire for the catastrophic years of 2017 and 2019 were \$34 billion,

double the insurance industry's profits in the state for the prior 26 years as estimated by Milliman (a consultancy).

and property from wildfires and reliable, available, and affordable property insurance in the WUI. The insurance market provides critical feedback to the State's efforts as the industry is dedicated to risk analysis. The industry is regulated by the State so public policy can play an appropriate role in influencing the role of risk reduction strategies on insurance market outcomes.

Funding Pathway Description

Design criteria for the proposed funding pathway for state wildfire risk reduction are described below:

- Generate annual ongoing statewide funding in the range (+/- 20%) of the state funding gap (currently at least \$630 million) while also encouraging local/regional funding measures
- Target funding source(s) with a connection to wildfire risk reduction based on the relationships between who bears the funding burden and who benefits from the risk reduction strategies to generate incentives for risk reduction by those most likely to benefit
- Use progressive funding structure and distribution to the greatest extent possible (see Equity Analysis, below)

Proposed Statewide Funding Source

We propose a surcharge on statewide property and casualty insurance premiums. The role of insurance in climate adaptation has been extensively explored in the research literature, and specifically the role of premium surcharges as an funding model.²⁹ The State currently imposes a 2.35% tax on all insurance premiums in lieu of a corporate income tax on insurers that operate in the state. Tax revenues accrue to the State's General Fund. This funding pathway would add the proposed surcharge to the current rate.

A hypothetical surcharge structure with revenue estimates is shown in Table 4.2. Key elements of the funding pathway that address the design criteria listed above include:

- The surcharge would generate an estimated \$514 million and fund 81% of the \$630 million net funding gap (see table 4.1).
- The surcharge is applied to an ongoing, essential, and relatively stable economic activity (insurance premium payments) resulting in a relatively predictable and sustainable funding source.
- The surcharge is applied to two different parts of the tax base:
 - A lower surcharge is applied statewide to all property and casualty insurance lines. This is designed to be a low rate applied to a broad tax base reflecting the statewide benefits of wildfire risk reduction in the WUI., including: reduced air pollution from catastrophic wildfires and reduced demands on the State's General Fund from fire suppression and disaster recovery.
 - A higher surcharge is applied (1) only in the WUI, and (2) only to insurance lines directly related to wildfire risks (fire, multiple peril, and auto). This reflects the greater benefits of wildfire risk reduction to WUI property owners, internalizing the costs of risk reduction strategies.

As shown in Table 4.2, the additional annual cost to a WUI property owner is \$56, spread across property and auto premiums. This is the maximum potential burden. The burden could be less to the extent that insurance companies do not fully pass on the surcharge to policy holders and instead reduce costs and/or profits.

²⁹ Keenan, Jesse M., Regional Resilience Trust Funds: An Exploratory Analysis for the New York Metropolitan Region, Harvard University Graduate School of Design

and Regional Plan Association, 2017; Keenan, Jesse M., Climate Adaptation Finance and Investment Policy in California, Routledge, 2019, p. 73.

| Table 4.2: Wildfire Risk Reduction | n insurance Su | rcharge | | | |
|--|--|---|---------------------------------|--|--|
| | 2 | 019 Revenue Ba | se | | |
| Revenue Base (Property & Casualty Earned Insurance Premiums) | Homeowner & Commercial Property (1) | All Other Property & Casualty | Total Property & Casualty | | |
| Statewide Earned Premiums (\$ mil.) | \$26,519 | \$50,004 | \$ 76,523 | | |
| WUI Only (assume 33% of state, see Table 4.1, note 3) | \$8,751 | \$16,501 | \$25,252 | | |
| Home & Auto Premium Average Annual Cost (2) | \$2,807 | NA | NA | | |
| | Hypothetical Revenue Alternative | | | | |
| Insurance Surcharge Options (Current Tax Rate is 2.35%, revenue to General Fund) | <u>Statewide</u> All Property & Casualty | <u>WUI Only</u> Homeowner & Commercial Property (1) | Total | | |
| Hypothetical Tax Surcharge | 0.50% | 2.00% | NA | | |
| Total Revenue (\$ mil.) | \$383 | \$131 (3) | \$514 | | |
| Additional Average Annual Premium Cost per Policy Holder (sum of non-commercial home & auto policies) | \$14 | \$56 | NA | | |

(1) Includes the following insurance lines: fire, homeowners' multiple peril, commercial multiple peril, private passenger auto physical damage and commercial auto physical damage.

(2) Based on an average homeowner's premium of \$1,280 for \$100k to \$500k of coverage, and an average non-commercial auto premium of \$1,527 for a \$100k/\$300k/\$100k bodily injury/property damage policy with a \$1,000 comprehensive/collision deductible.

(3) WUI tax surcharge revenue is net additional amount above revenue from statewide tax surcharge.

Sources: California Department of Insurance, "2019 California Property & Casualty Premium and Loss Summary" (2019 earned premium data); https://www.thezebra.com/auto-insurance/california-car-insurance/ca-average-cost-of-auto-insurance/ (accessed 12/15/2020) (average auto premium data); (https://www.policygenius.com/homeowners-insurance/californiahomeowners-insurance-guide/) (accessed 12/15/2020) (average home premium data).

Alternative State Funding Sources

Theoretically, the State could generate new revenue from any number of sources. The largest sources of revenue for the State's general fund estimated for FY2020-21 (\$billion/share) includes the personal income tax (\$78b/57%), sales and use tax (\$21b/15%), and corporation income tax (\$16b/12%). Increasing revenue by one% from these sources would generate \$780 million, \$210 million, and \$160 million, respectively.

Taxes and fees that could be directly applied to the WUI only include (1) increasing the

property transfer tax rate, (2) imposing a surcharge on local impact fees, and (4) adopting a fire prevention assessment such as the one levied by the State from FY 2011-12 through FY 2016-17. Potential revenues from these sources are shown in Table 4.3. Expansion of existing GGRF funding for wildfire risk reduction was not considered because the GGRF is not designed to provide sustainable funding. In addition, the GGRF's primary mission to reduce greenhouse gas emissions does not sufficiently overlap with the risk reduction strategies presented for this funding pathway (see Table 4.1).

| Тох | Current Tax Base / | Droposod Instance | Annual Additional Revenue | | | | | | | |
|-----------------------------|---|--|---------------------------|---------------------|--|--|--|--|--|--|
| IdX | Tax Revenue | Proposed increase | Statewide | WUI Only (1) | | | | | | |
| Property transfer tax | \$1.10 tax per \$1,000 of sales price | Double tax rate to \$2.20 per \$1,000 sales price | \$265 million | \$87 million | | | | | | |
| Surcharge local impact fees | Estimate \$30,000 per home | 10% surcharge on all impact fees | \$240 million | \$80 million | | | | | | |
| Fire prevention fee | Prior assessment was \$152.33 per habitable structure (2) | Reinstate prior fee | NA | \$80 million (3) | | | | | | |

Table 4.3: Potential Revenues for Wildfire Mitigation

(1) The WUI is estimated to be 33 % of the State's tax base.

(2) The assessment was imposed from FY 2011-12 through FY 2016-17 and included a \$35 discount for properties served by a local fire protection agency or district.

(3) The assessment was imposed within the State Responsibility Area (SRA), land where the State is financially responsible for wildfire prevention and suppression. The SRA is comprised of over 31 million acres across the State and does not include lands within incorporated city boundaries or in federal ownership. Eliminated with assumption that GGRF would backfill. The GGRF backfill is a continuous appropriation (comes "off the top").

Local/Regional Revenue Measures

As shown in Table 4.1 and explained in the accompanying text regarding "Community Resilience" strategies, local and regional public agencies need to raise an estimated \$470 million annually for activities tailored to their region. Twenty percent of this amount is assumed to come from the proposed statewide funding pathway as an incentive and to reduce the burden on disadvantaged communities. Regardless of the level of state assistance, communities will need to redirect existing funding or generate new funding for a range of local risk reduction strategies, particularly in Local Responsibility Areas.³⁰

Along with supporting adoption of a statewide revenue source, another high-leverage point would be supporting stakeholder coalitions for voter approval of regional revenue measures and formation of regional joint powers authorities (JPAs) where needed to manage wildfire risk reduction efforts. Regional funding models include the Marin Wildfire Prevention Authority, a JPA of 17 local agencies supported by a parcel tax. Opportunities exist to leverage the substantial grassroots volunteer and public agency efforts embodied in the over 100 fire safe councils that exist throughout the state, Current efforts at regional cooperation include:

- The Oakland Fire Safe Council initiative to form a JPA across Alameda and Contra Costa counties
- The County of Orange Area Safety Task Force (COAST), a collaboration of nearly three dozen public agencies, municipalities, landowners, land managers and other organizations directly affected by wildland fire in Orange County

³⁰ Local agencies are responsible for fire suppression in Local Responsibility Areas as opposed to the State's responsibility in State Responsibility Areas.

Equity Analysis

Impact of climate change

While the WUI is home to wealthy ex-urban communities, it is also home to low-income households and those who have moved away from urban centers due to high housing costs. Disadvantaged communities and low-income households have fewer resources to adapt to wildfire. Low-income households will also have more difficulty absorbing increased wildfire-related insurance rates and increases in housing costs in areas where wildfire has destroyed homes.

The structure of the funding source

A progressive revenue mechanism would address equity disparities and include personal income, corporate income, and estate taxes. A progressive tax structure is based on the taxpayer's ability to pay, imposing a lower tax rate on lower-income taxpayers, and increasing rates on higher levels of income. The proposed insurance premium surcharge is progressive to the extent that it would act like a corporate income tax and be paid from insurance industry profits. The surcharge would be neutral (constant share of income) to the extent that insurance premiums are correlated with larger homes and larger household incomes. The surcharge would be regressive to the extent that WUI homeowners would pay a higher rate, and to the extent they have relatively low incomes for the same insurance coverage, compared to other homeowners.

The other revenue sources shown in Table 4.3 are imposed at a flat rate on consumption, so impacts are probably regressive. Consumption taxes are regressive because lower-income taxpayer spend a higher percentage of their income on consumption as opposed to savings.

The distribution of the funded benefits

Equity is addressed in the expenditure of funds on the risk reduction strategies described in conjunction with Table 4.1:

- State funding for adoption of building hardening and defensible space measures would focus on low-income households
- The subvention formula to support community resilience would allocate more funding per capita to disadvantaged communities to offset wealth disparities
- The State would focus landscape-scale fuels reduction projects in low-income rural communities to the extent consistent with risk reduction criteria

Implementation

Implementation issues and challenges include:

- Defining the WUI boundary based on wildfire risk for purposes of the insurance surcharge
- Apportioning the insurance surcharge between WUI property owners and other owners statewide in a fair and equitable manner
- Identifying the most effective use of funds to distinguish landscape-level vegetation management and ignition prevention for wildfire risk reduction from forest health initiatives in general
- Prioritizing landscape-level projects based on cost effectiveness (highest number of homes protected for the least level of expenditures) while not ignoring smaller and more isolated rural communities
- Developing a market for low-value biomass to lower the cost of fuel reduction projects
- Structuring insurance surcharge subvention formula for community resilience strategies to incentivize local

action, including adoption of local revenue measures, while adjusting for disadvantaged communities with lower revenue potential

The main challenge in implementing this proposal is the political difficulty for the State Legislature and Governor to adopt a new revenue source. Complicating factors include (1) the significant amount of proposed funding (\$514 million annually), (2) the burden placed on property owners (to the extent the surcharge is passed on by insurers), and (3) the likely opposition of the insurance industry (interviews for this effort indicate the industry has significant influence in Sacramento).

The policy window for such action may occur only after several additional seasons of catastrophic wildfires with significant property damage and air pollution with statewide impacts. Continued turmoil in the WUI property insurance market may also be a prerequisite. The legislative package may require insurance market reforms beyond the proposed reinsurance funding shown in Table 4.1.

Given this challenge, feasibility will depend upon the coalition of interests that organize to support a statewide revenue measure. Potential stakeholders include:

- The over 100 fire safe councils located throughout the state and their multiple stakeholders
- Environmental groups supportive of the benefits to forest, chaparral, and grasslands habitats from active vegetation management³¹
- Environmental justice groups to the extent that implementation would benefit disadvantaged communities disproportionately
- Rural communities vulnerable to wildfire in general, and specifically those communities that would benefit from economic development associated with fuel reduction projects and new markets for low-value biomass
- Electric utilities with liability exposure to wildfire
- Water agencies with infrastructure vulnerable to wildfire
- Air quality management districts in locations where reducing the intensity of wildfires will reduce air pollution and related health impacts
- Insurance industry, consumer groups, and the real estate industry if implementation leads to reliable, available, and affordable insurance for WUI property owners

³¹ Indeed, without active fire prevention certain chaparral habitats predominantly located in Southern California

will burn too often and cause "type conversion" to nonnative species.



Conclusions

While the four funding pathways proposed in this report stand on their own, a few crosscutting findings have emerged. They include recognizing the enormity of the funding need; improving social equity through revenue distribution; the need for state legislative change; and the importance of building coalitions.

The funding need is enormous

Every funding pathway we have focused on will need expansion in the long run to provide fully scaled funding for climate change adaptation. To pay for this expansion, exactions in one form or another on taxpayers and the economy at large will need to increase. Under California law, such exactions at any significant scale require voter approval. Consequently, the most crucial long-term issue is how to get voters to approve higher taxes for climate change adaptation. We base this

conclusion on the assumption that Federal and State grant programs cannot fund fully scaled climate change adaptation without significant local share contributions.

The distribution of benefits needs to improve social equity

As noted throughout this report, we believe that none of existing tax and/or assessment powers granted to local and regional government in California are socially equitable. The only socially equitable tax in California is the State income tax, which is reserved by the State's constitution solely for the State government itself. Short of amending the constitution to provide income tax authority at the local or regional level, social equity in the funding of climate change adaptation will depend on the allocation of funds received from taxes, assessments, or grants.

<u>State legislative change is</u> <u>required</u>

Even the most immediately feasible of the four proposals, transportation grants for regional sea level rise adaptation planning, will require some legislative change. In a post-COVID-19, resource-constrained world, proponents of increasing climate adaptation funding will need to build enough political will to make these changes. They may need to link climate adaptation funding proposals to public health, economic recovery, and workforce policies to build a sufficiently broad base of support.

Success will require building coalitions

Implementing any of the four climate adaptation funding pathways will require the sustained support of a diverse coalition of stakeholders. A successful coalition will feature a heterogenous group of stakeholders whose different priorities point to overlapping co-benefits and complementary trade-offs. These coalitions will likely need to bring together state policy makers to design legislative tradeoffs; county and city officials to identify implementation opportunities; representatives of disadvantaged communities to convey needs and priorities for benefit distribution; representatives of the business community and trade unions to identify employment opportunities and technological solutions; property owners to convey their needs in exchange for increased assessment. While building a coalition this broad takes time and resources, it presents the likeliest way to implement each of the four proposed funding pathways.

APPENDIX A. Scope of Potential New Revenue Sources

Three of the four proposed funding pathways require new sources of revenue, with the exception of the fourth – the transportation planning funding pathway. This section identifies potential sources of new revenue from state, regional or local taxes. It is intended as a starting point for discussion on opportunities to shift existing exactions or create new exactions to support climate adaptation and equity across a range of funding pathways.

Where Tax Authority Lies

Taxing authority depends on tax type. The State of California has sole authority to levy an income tax and to surcharge insurance premiums. Cities and counties can tax retail electric sales within their jurisdictions through a utility users' tax. Sales tax can be increased by the State, counties, and cities. Property transfer tax rates are controlled by the State but levied at the local level. Development impact fees are levied at the local level.

Regional governments or entities do not have any generic authority to levy a tax unless their authorization legislation specifically provides for it. However, joint powers authorities, do have the authority to levy taxes, based on any statutory authority common to all of their members.

Table A.1 summarizes major taxes in California that are potentially at the scale required for sustainable long-term funding of climate change adaptation.

| Тау | Enabling Authority | | | | | | | |
|---|---|--|--|--|--|--|--|--|
| IdX | State Legislature | Regional Agency | Local (Cities, Counties) | | | | | |
| Personal income tax | Yes | None | None | | | | | |
| Sales tax | Yes | Joint Powers Authority (JPA) and multi-jurisdiction 2/3 vote of registered voters (1). | 2/3 vote of registered voters (1) | | | | | |
| Corporate income tax | Yes | None | None | | | | | |
| Property transfer tax | Tax rate controlled at state level, but levied and spent at local level | None | Only charter cities can increase tax from State mandated level | | | | | |
| Development Impact fees (only for projects that benefit new development) | No | JPA with majority approval of local jurisdictions' governing body | Yes, with majority approval of local jurisdiction governing body | | | | | |
| Surcharge on insurance premiums | Yes | None | None | | | | | |
| Surcharge on retail electricity sales | Yes | Joint Powers Authority (JPA) and multi-jurisdiction 2/3 vote of registered voters (2) | 2/3 vote of registered voters (2) | | | | | |

Table A.1. Summary of Potential Tax Sources for Climate Adaptation

Notes:

(1) Sales taxes may be approved by majority vote but only if expenditures are not restricted to any specific use, an unlikely scenario for a climate adaptation plan.

(2) State enabling authority is for a utility users' tax that is imposed on electricity, gas, water, sewer, telephone, telegraph, and cable television services. As with sales tax, 2/3 vote required if tax proceeds are used for specific purposes. Simple majority required if used for general purposes.

<u>The Amounts New Taxes Could</u> <u>Raise</u>

We calculated preliminary estimates of the amount of revenue that could be raised from new exactions. Table A.2 presents budgeted FY 2020-21 revenue for each tax category, reflecting the current recessionary environment. Amounts are shown either in terms of actual tax receipts, or in terms of the taxable cash flow (the tax base or level of economic activity) that could be taxed.

| Tax Category | Statewide annual tax revenue or tax base | Tax Rate/Revenue Increase Assumptions | Notes |
|--|--|--|--|
| Income tax (State receipts, combined personal and corporate) | \$94,101,000,000 | An increase sufficient to generate a 1% increase in total receipts | FY 2020-21 budget |
| Sales tax (State receipts) | \$20,593,000,000 | An increase sufficient to generate a 1% increase in total receipts | FY 2020-21 budget (3.94% effective tax rate) |
| Property transfer tax (estimate of taxable cash flow) | \$240,625,000,000 | Double the current authorized tax rate of \$1.10/\$1,000 of sales price | 437,500 homes sales (2019) at a Zillow average price of \$550,000 |
| Development impact fees (estimate of city/county fee receipts) | \$2,400,000,000 | A tax of 10% on the amount of combined development impact fees levied | \$30,000 per house average combined impact fee at 80,000 new homes per year (Building Industry Association) |
| All insurance premiums (taxable cash flow) | \$78,249,000,000 | A statewide levy of 1% on the amount of premium collected (existing State premium surcharge is 2.35%) | 2019, State Department of Insurance |
| Property and casualty (P&C) insurance premiums (taxable cash flow) | \$26,945,000,000 | A statewide levy of 1% on the amount of premium collected (existing State premium surcharge is 2.35%) | 2019, State Department of Insurance |
| Retail electric sales (taxable cash flow) | \$37,899,000,000 | A statewide equivalent to a utility users tax of 1% of retail sales volume | 2019, CPUC and CAFR's for Muni utilities |

Table A.2. Estimated Tax Base

These estimates do not factor in potential opposition but do capture the estimated impacts of the COVID-19 pandemic on the

state budget. The goal of this exercise is to determine the tax revenue from (1) a 1% increase in the current State receipts from income tax and sales tax and (2) a 1% tax on the taxable cash flows for the other tax categories. The one exception to these rules is development impact fees. To generate an appropriate level of revenue, the tax would need to amount to at least 10% of the amount of fees levied. We also present two scenarios for insurance surcharge: (1) a surcharge levied on all premiums administered by the Department of Insurance; and (2) a surcharge levied just on premium categories directly connected to property and casualty (P&C) risks.

The largest tax cash flow in Table A.2 is for the State income tax. The sales tax receipts by the State shown in Table A.2 represent solely the share of sales tax receipts retained by the State for its own budget, not the share retained by cities, counties, or other taxing entities at the local level. The other five potential tax categories (excluding development impact fees) all show actual taxable cash flows. The biggest such cash flow in that regard is for property transfers – estimated at \$240 billion for 2019.

<u>Projected Revenues Based on</u> <u>Two Scenarios</u>

Drawing on the calculations in Table A.2, we estimated potential revenues based on two taxation scenarios: (1) a statewide tax; and (2) a tax of areas within the wildland-urban interface (WUI) (Table A.3). To estimate the size of the WUI, we assumed that roughly 20% of the taxable cash flows of the State originate in the WUI, as defined by windstorm risk (some estimates are as high 25%). This adjustment for the WUI is particularly applicable to three of the seven tax categories Table A.2: (1) insurance premium surcharge, (2) property transfer tax and (3) development impact fees.

If each of these relatively modest tax increases were enacted on a statewide basis, the total annual revenue would be \$2.8 billion. For comparison, the State's Cap-and-Trade Program generated from \$2.1 to \$3.2 billion per year to the State for fiscal years 2017-18 through 2019-20. Without a tax increase at this level for at least one of the larger revenue sources shown below, a significant intervention for climate change adaptation is not realistic.

| Tax Category | Statewide Tax | WUI-only Tax (20% of State) | Notes |
|--|---------------|--------------------------------|---|
| 1% increase in State personal and corporate income tax | \$941,000,000 | \$188,000,000 | Based on Governor's FY 2020-21 budget |
| All insurance premiums at 1% | \$782,000,000 | \$156,000,000 | 2019 Dept. of Insurance premiums collected data |
| Retail electric power sales at 1% | \$379,000,000 | \$76,000,000 | Only retail sales are taxed |
| Property and casualty (P&C) premiums at 1% | \$269,000,000 | \$54,000,000 | 2019 Dept. of Insurance premiums collected data for just P & C |
| Sales tax at 1% of State's 3.94% share of sales tax | \$206,000,000 | \$41,000,000 | Combined sales taxes in State vary from 7 to 10%. State General Fund share is 3.94% |

Table A.3. Potential Annual Revenues by Tax Category

| Tax Category | Statewide Tax | WUI-only Tax (20% of State) | Notes |
|---|-----------------|--------------------------------|---|
| Property transfer tax on residential at twice existing rate | \$265,000,000 | \$53,000,000 | Estimated based on 435,000 homes sales in 2019 at average sales price of \$550,000. Current tax rate is \$1.1/\$1,000 of sales price |
| 10% surcharge on all residential development impact fees | \$240,000,000 | \$48,000,000 | Current development impact fees estimated based on average combined impact fee of \$30,000 per unit and approximately 80,000 new homes constructed per year |
| Total with surcharge on all insurance premiums | \$2,813,000,000 | \$562,000,000 | |
| Total with surcharge on property P&C premiums only | \$2,300,000,000 | \$460,000,000 | Shown here is potential revenue from 1% of premium collected surcharge solely levied on P&C-related premiums. |

Bonding Capacity Based on Two Revenue Scenarios

Using the estimates in Table A.3, we can demonstrate the scaling possible from tax increases of this magnitude. Table A.4 shows bonding capacity based on the tax increases for four scenarios:

- Tax increases on the entire state, with the insurance premium surcharge on all premiums collected
- Tax increases on the entire state, with insurance premium surcharge on only P&C premiums

- Tax increases solely on the WUI, with the insurance premium surcharge on all premiums collected
- Tax increases solely on the WUI, with the insurance premium surcharge on only P&C premiums

Bonding capacity under these four scenarios ranges from \$8.5 billion to \$51 billion. In theory, federal grant money could match the bond funded share shown in Table A.4, which could double the funds available. This exercise demonstrates the magnitude of tax increases required to fund a major intervention for climate change adaptation.

| | Statewide Tax | WUI-only Tax (20% of State) | Notes |
|---|------------------|--------------------------------|---|
| Combined taxes with surcharge on all insurance premiums | \$46,563,000,000 | \$9,303,000,000 | 1.1 coverage results in 10% of annual revenue being available for operations after debt service |
| Combined taxes with surcharge on property and casualty (P&C) insurance premiums only | \$38,072,000,000 | \$7,614,000,000 | 1.1 coverage results in 10% of annual revenue being available for operations after debt service |

Table A.4. Bonding Capacity by Scenario

Note: Assumes 1.1 times debt coverage, 30-year term, 3.5% fixed interest, 1% costs of issuance.

A key question to consider is the allocation of annual revenue between ongoing expenses and debt service for capital projects. Table A.4 assumes that all tax revenues are pledged to bond issues, using a 1.1 times debt coverage ratio. That means approximately 9% of the tax revenue is left over after debt service payments, assuming a stable revenue flow. That amount is likely insufficient to fund operations and maintenance. This is particularly true for WUI risk mitigation, which is more operationally intensive than capital intensive.

It is also worth noting that matching bond funding with grant funding can significantly leverage project funding. For example, if the bonding in the "tax the entire state" scenario was reduced to \$25 billion, annual revenues available for operating expenses would amount of over \$1.6 billion per year, assuming stable revenues.

Implications for Proposed Funding Pathways

Geographic scope

Any efforts to increase taxes to pay for climate adaptation will need to decide at what level of government to apply them: statewide, regionally, or locally. As noted in Table A.1, application of income tax, insurance premium surcharges and property transfer tax all need new State authorization, even if they are applied regionally or locally.

Impact on equity

Of all the tax categories discussed in this section, only the State income tax is truly equitable and progressive. Sales tax is arguably the most regressive tax shown above, along with a utility users tax on electric retail sales. The insurance surcharge, particularly when confined to the WUI, is equitable, but not progressive. The same is true for the property transfer tax. Development impact fees are to some degree equitable but are not progressive.

While a climate adaptation-related State income tax would be progressive, it would also face implementation challenges. The State has never before allowed any other public entity to levy an income tax. Such a tax would need to be administered by the Franchise Tax Board, and then allocated to regional or local government similar to how the State Board of Equalization administers sales tax.

Potential Communities of Support

Tax increases have few supporters. The application of the tax proceeds would get some support from communities directly threatened by either WUI fire risk, sea level rise, or water management problems associated with loss of the snowpack of the western Sierra Nevada. In this regard, allowing for either regional authorization or regional allocation, or both, could be very important to building support.

APPENDIX B. List of People Consulted

| | Category | Organization | Name | Title | 1. Transportation Planning | 2. Extreme Heat | 3. Resilience Financing Districts | 4. Wildfire Risk Reduction |
|-----|-----------|--|-----------------------------|--|-------------------------------|-----------------|---|-------------------------------|
| 1. | CA Agency | California Earthquake Authority | Glenn Pomeroy | Executive Director | • | • | • | • |
| 2. | CA Agency | Caltrans | Ann Mahaney | Office Chief for Economics & Data Management | • | | | |
| 3. | CA Agency | Caltrans | Jackie Kahrs | Regional Coordination Branch | • | | | |
| 4. | CA Agency | Caltrans | Jeff Newman | Dist. 7 Public Affairs | • | | | |
| 5. | CA Agency | Caltrans | Priscilla Martinez-Velez | Grant and Resource Management Branch | • | | | |
| 6. | CA Agency | Caltrans | Ryan Ong | Staff Economist/Research Analyst | • | | | |
| 7. | CA Agency | Caltrans District 4 | Stefan Galvez- Abadia | Division Chief | • | | | |
| 8. | CA Agency | Caltrans District 7 (SoCal) | Paul Marquez | Planning Division Director | • | | | |
| 9. | CA Agency | Caltrans Division of Environmental Analysis | Tammy Massengale | District 4 Coordinator | • | | | |
| 10. | CA Agency | Coastal Conservancy | Sam Schuchat | Executive Officer | • | | • | |
| 11, | CA Agency | Department of Community Services & Development (CSD) | Charles Belk | Assistant Deputy Director | | • | | |

| | Category | Organization | Name | Title | 1. Transportation Planning | 2. Extreme Heat | 3. Resilience Financing Districts | 4. Wildfire Risk Reduction |
|-----|-----------|--|------------------|---|-------------------------------|-----------------|---|-------------------------------|
| 12. | CA Agency | Department of Community Services & Development (CSD) | Kathy Andry | Deputy Director | | • | | |
| 13. | CA Agency | Department of Public Health | Linda Helland | Climate Change & Health Equity Section Chief | | | | |
| 14. | CA Agency | Natural Resources Agency | Amanda Hansen | Deputy Secretary for Climate Change | • | • | • | • |
| 15. | CA Agency | Natural Resources Agency | Nancy Vogel | Director of Governor's Water Portfolio Program | • | | • | • |
| 16. | CA Agency | Natural Resources Agency | Jessica Morse | Deputy Secretary for Forest Resource Management | | | | • |
| 17. | CA Agency | Office of Planning & Research | Nuin-Tara Key | Deputy Director, Climate Resilience | • | • | • | • |
| 18. | CA Agency | Sierra Nevada Conservancy | Angela Avery | Executive Officer | | | • | • |
| 19. | CA Agency | Sierra Nevada Conservancy | Julie Alvis | Deputy Executive Officer | | | • | • |
| 20. | CA Agency | Sierra Nevada Conservancy | Brittany Covich | Branch Manager | | | • | • |
| 21. | CA Agency | Transportation Agency (CalSTA) | Darwin Moosavi | Deputy Secretary, Environmental Policy | • | | | |

| | Category | Organization | Name | Title | 1. Transportation Planning | 2. Extreme Heat | 3. Resilience Financing Districts | 4. Wildfire Risk Reduction |
|-----|-------------------------|--|---------------------|---|-------------------------------|-----------------|---|-------------------------------|
| | | | | and Housing Coordination | | | | |
| 22. | CA Legislature | Legislative Analyst's Office | Rachel Ehlers | Principal Fiscal & Policy Analyst | • | • | • | • |
| 23. | CA Legislature | Office of Assembly Speaker Rendon District 63 | Marie Liu | Staff member | • | • | • | • |
| 24. | CA Legislature | Office of Senator Dodd | Les Spahnn | Legislative Director | | | | • |
| 25. | Local/Regional Govt. | Bay Area Regional Consortium | Allison Brooks | Executive Director | • | • | • | • |
| 26. | Local/Regional Govt. | City of Berkeley | Katie Van Dyke | Climate Coordinator | • | • | • | • |
| 27. | Local/Regional Govt. | City of Chico | Chris Constantin | Assistant City Manager | | • | | • |
| 28. | Local/Regional Govt. | City of Oakland | Adrienne Harris | Sustainability Fellow | • | • | | |
| 29. | Local/Regional Govt. | County of Alameda | Sarah Church | Sustainability Project Manager | • | • | • | • |
| 30. | Local/Regional Govt. | County of El Dorado Transportation Commission | Woody Deloria | Executive Director | • | | • | |
| 31. | Local/Regional Govt. | County of Marin | Chris Choo | Principal Watershed Planner | • | | • | |
| 32. | Local/Regional Govt. | County of Marin | Jack Liebster | Planning Manager | • | | • | • |
| 33. | Local/Regional Govt. | County of San Mateo Community College District | Isabel Pares | Zero Waste Associate, Climate Corps Fellow | • | • | | |

| | Category | Organization | Name | Title | 1. Transportation Planning | 2. Extreme Heat | 3. Resilience Financing Districts | 4. Wildfire Risk Reduction |
|-----|-------------------------|--|-----------------------|--|-------------------------------|-----------------|---|-------------------------------|
| 34. | Local/Regional Govt. | County of San Mateo Flood and Sea Level Rise Resiliency District | Len Materman | Chief Executive Officer | • | | • | |
| 35. | Local/Regional Govt. | County of Santa Clara | Jasneet Sharma | Director of Sustainability Office | • | • | • | • |
| 36. | Local/Regional Govt. | County of Sonoma | Christopher Godley | Director of Emergency Management | • | • | • | • |
| 37. | Local/Regional Govt. | Metropolitan Transportation Commission (MTC) | Rachel Hortefilis | Resiliency Planner | • | | • | |
| 38. | Local/Regional Govt. | MTC/ Association of Bay Area Governments (ABAG) | Bill Bacon | Funding Policy & Program Division | • | | • | |
| 39. | Local/Regional Govt. | NBS | Sara Mares | Director | | | • | |
| 40. | Local/Regional Govt. | Port of San Francisco | Lindy Lowe | Resilience Program Manager | | | • | |
| 41. | Local/Regional Govt. | San Francisco Public Utilities Commission (SFPUC) | David Behar | Climate Program Director | • | | • | |
| 42. | Local/Regional Govt. | Town of Paradise | Katie Simmons | Disaster Recovery Director | | | • | • |
| 43. | Nonprofit Advocacy | American Forest Foundation | Jillian Dyszynski | Director of Market Development | | | | • |
| 44. | Nonprofit Advocacy | Bay Area Climate Adaptation Network (BayCAN) | Yeshe Salz | Project Manager - Climate Equity Lead | • | • | • | • |
| 45. | Nonprofit Advocacy | California ReLeaf | Chuck Mills | Director, Public Policy & Grants | | • | | |

| | Category | Organization | Name | Title | 1. Transportation Planning | 2. Extreme Heat | 3. Resilience Financing Districts | 4. Wildfire Risk Reduction |
|-----|-----------------------|--|----------------------|---|-------------------------------|-----------------|---|-------------------------------|
| 46. | Nonprofit Advocacy | Climate Resolve | Louis Blumberg | Consultant | | • | | |
| 47. | Nonprofit Advocacy | Climate Resolve | Woodrow Covington | Grants and Proposals Director | | | • | |
| 48. | Nonprofit Advocacy | Climate Resolve | Natalie Hernandez | Associate Director, Climate Planning & Resilience | | • | | |
| 49. | Nonprofit Advocacy | Climate Resolve | Seth Jacobson | Senior Director of Water and Energy Programs | | • | | |
| 50. | Nonprofit Advocacy | Greenlining Institute | Sonrisa Cooper | Environmental Equity Director | | | • | |
| 51. | Nonprofit Advocacy | Irvine Ranch Conservancy | Mike O'Connell | CEO | | | | • |
| 52. | Nonprofit Advocacy | LA Cooling Collaborative / Tree People | Edith de Guzman | Head of Los Angeles Urban Cooling Collaborative | | • | | |
| 53. | Nonprofit Advocacy | Mycelium Youth Network / West Oakland Environmental Indicators Project | Phoenix Armenta | Educator | • | • | | |
| 54. | Nonprofit Advocacy | Northern California Resilience Network. | Susan Silber | Director | • | • | • | • |
| 55. | Nonprofit Advocacy | Oakland Firesafe Council | Sue Piper | President | | | | • |
| 56. | Nonprofit Advocacy | Personal Insurance Federation of California | Rex Frazier | President | | | | • |

| | Category | Organization | Name | Title | 1. Transportation Planning | 2. Extreme Heat | 3. Resilience Financing Districts | 4. Wildfire Risk Reduction |
|-----|-----------------------|--|-----------------|--|-------------------------------|-----------------|---|-------------------------------|
| 57. | Nonprofit Advocacy | Public Health Alliance of Southern California | Tracy Delaney | Director | | | | • |
| 58. | Nonprofit Advocacy | Rural County Representatives of California | Barbara Hayes | Chief Economic Development Officer | | | • | • |
| 59. | Nonprofit Advocacy | Sierra Business Council | Steve Frisch | Director | | | | • |
| 60. | Nonprofit Advocacy | United Policyholders | Amy Bach | Executive Director | | | | • |
| 61. | Nonprofit Advocacy | United Policyholders | Valerie Brown | Senior Program Officer | | | | |
| 62. | Nonprofit Research | Climate Readiness Institute / BayCAN | Bruce Riordan | Program Director / Director | • | • | • | • |
| 63. | Nonprofit Research | Public Health Institute | Linda Rudolph | Director of the Center for Climate Change and Health | | • | | |
| 64. | Nonprofit Research | Public Policy Institute of California | Dean Misczynski | Fellow | • | • | • | • |
| 65. | Nonprofit Research | Public Policy Institute of California | Henry McCann | Research Associate | | | | • |
| 66. | Nonprofit Research | San Francisco Bay Estuary Partnership | Judy Kelly | Former Director | • | | • | |
| 67. | Nonprofit Research | Stanford Woods Institute for the Environment | Michael Wara | Director, Climate and Energy Policy Program | • | • | • | • |
| 68. | Nonprofit Research | UC Berkeley Center for Law, Energy & the Environment | Ethan Elkind | Director, Climate Program | | | • | |

| | Category | Organization | Name | Title | 1. Transportation Planning | 2. Extreme Heat | 3. Resilience Financing Districts | 4. Wildfire Risk Reduction |
|-----|-----------------------|---|---------------------|---|-------------------------------|-----------------|---|-------------------------------|
| 69. | Nonprofit Research | UC Berkeley Center for Law, Energy & the Environment | Dave Jones | Director, Climate Risk Initiative | | | • | • |
| 70. | Nonprofit Research | UC Berkeley Center for Law, Energy & the Environment | Ted Lamm | Senior Research Fellow, Climate Program | | | • | • |
| 71. | Nonprofit Research | UCLA Emmett Institute on Climate Change and the Environment | Sean Hecht | Co-Executive Director | • | | • | • |
| 72. | Nonprofit Research | UCLA Luskin Center for Innovation | J.R. DeShazo | Director | • | • | • | • |
| 73. | Nonprofit Research | UCLA Luskin Center for Innovation | Lolly Lim | Research Analyst | | • | | |
| 74. | Other | Integral Group | Brenden McEneany | Principal | | • | | |
| 75. | . Other | Nexus Planning & Research | Dennis Larson | Principal | • | | | |
| 76. | . Other | PG&E | Nathon Bengsston | Climate Resilience | | | | • |
| 77. | Other | Quint & Thimmig | Paul Thimmig | Partner | | | • | |
| 78. | . Other | Richards, Watson & Gershon | Bill Strausz | Partner | | | • | • |