

# South San Francisco Shoreline Protection and Connectivity Project Feasibility Study

City of South San Francisco





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# Transmittal Letter

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**ARUP**

June 23, 2025

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## **Re: Proposal for the South San Francisco Shoreline Protection and Connectivity Project Feasibility Study**

Dear Audriana and Members of the Selection Committee,

Arup US, Inc. (Arup) is delighted to submit our proposal for the Shoreline Protection and Connectivity Study. We see this as a pivotal project for the City of South San Francisco, poised to unlock multiple opportunities for sustained development in the East of 101 area. It will also foster a more connected, resilient community along the city's vital shoreline. We recognize the technical complexities, regulatory hurdles, and financial considerations involved, and this is precisely the kind of challenging and impactful work Arup excels at and enjoys.

Over the past four decades in the Bay Area, Arup has become a recognized leader on coastal resilience, civil engineering, and transportation planning. Together with WRT, Fehr & Peers, Winter Consulting, and the San Francisco Estuary Institute, our team brings significant and direct experience to this shoreline study. We are proud to collaborate with these firms to provide expert transportation planning and engineering capabilities, unparalleled coastal resilience expertise, and a strong understanding of South San Francisco's community engagement needs.

We have reviewed the proposed terms and conditions included with the RFP and find them generally acceptable. Should our submission be of interest, we would seek to discuss a limited number of provisions including but not limited to: (i) incorporating an overall limit of liability for the design team taking into account the nature of services and level of fee; (ii) aligning the professional indemnity obligation with industry standards by removing the upfront duty to defend and limiting to third party claims; and (iii) clarifying insurance levels and removing the 'excess insurance' provision.

Arup acknowledges receipt of Addendum 1.

Sincerely,



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# Executive Summary

# 2



A photograph of a coastal park area. In the foreground, a wooden bench sits on a path covered in dry leaves. To the right, a large, dark green tree stands prominently. In the background, a body of water is visible, with a city skyline and hills in the distance under a cloudy sky.

## Executive Summary

The proposed corridor connection into the East of 101 area is an essential strategy to addressing longstanding mobility issues. It can also resolve the looming threat of sea level rise and safeguard future generations along the city's shoreline. Arup has risen to this challenge of solving complex transportation and resilience issues with many communities along the California coastline, where we have driven innovative and integrated solutions. Through a collaborative process, we will work closely with the City, partner agencies, and stakeholders to achieve the goals of the Shoreline Study and deliver solutions that are implementable and financially viable.

Our approach is focused on the delivery of actionable, phased, and fundable solutions for the unique challenges in connectivity, mobility, and vulnerability to coastal hazards along the South San Francisco shoreline.



## As the leading firm on transportation resilience work in California, Arup is uniquely qualified for this study.



We bring technical depth, a passion for the work, and a commitment to strong client relationships, exemplified by our collaborative partnerships with clients such as Caltrans on the California Statewide Climate Risk and Vulnerability Assessment, and the City of Sausalito on their Shoreline Adaptation Plan.



Unlike many firms that focus on hardening infrastructure, we offer a distinct approach focused on systems and people, and by championing nature-based solutions. We design infrastructure for the way commuters, workers, and families actually use it, rather than just its structural performance. We will bring this holistic, human-centered approach to the Shoreline Study to unlock solutions that fully reflect City and community priorities.



Our in-house multidisciplinary team provides comprehensive engineering expertise to this study—from water and rail to bridges, geotechnical, and cost estimating—and will be on hand through the entire project lifecycle.



We are uniquely practiced in bridging the critical gap between the vulnerability assessment phase and the formal design and environmental permitting phase of coastal resilience projects—a stage where many projects falter due to “analysis paralysis.” Our portfolio of built projects along waterfronts in major cities around the world is a testament to this.






**Bothin Marsh Evolving Shoreline Adaptation Study. Source: WRT**

## Our team

The Arup Team brings together nationally recognized expertise in climate adaptation, transportation planning, civil engineering, community engagement, environmental science, and urban design. We use three criteria to select our team: what is in the client's best interest, who brings the most trusted expertise, and who is a joy to collaborate with. The result is powerful blend of technical rigor, local knowledge, and passion for tackling complex adaptation challenges in creative ways.

Summaries of each firm and their project role are provided below:

Firm and Role	Value to Project
 <p>Prime consultant, leading on coastal flooding, engineering, and resilience</p>	<p>Arup is a global leader in sustainable and resilient planning and design. Our interdisciplinary team brings deep expertise in climate adaptation measures to deliver innovative, actionable solutions tailored to California communities. With extensive experience coordinating with agencies like the San Francisco Bay Conservation and Development Commission (BCDC), United States Army Corps of Engineers (USACE), and the California Coastal Commission (CCC), we guide clients through sea level rise adaptation with a collaborative, results-driven approach.</p>
 <p>Adaptation strategies and visual communications</p>	<p>WRT is a planning and design firm with nearly a decade of leadership in Bay Area coastal climate adaptation. Their team of planners, urban designers, and landscape architects delivers integrated, forward-thinking solutions that address land use, mobility, open space, and equity in complex urban and natural environments.</p>
<p><b>Fehr&amp;Peers</b></p> <p>Transportation analysis lead</p>	<p>Fehr &amp; Peers is a full-service, multimodal transportation planning and engineering firm with expertise in Complete Streets roadway design, multimodal operations and simulation, bicycle and pedestrian planning, and much more. They have worked extensively with the City of South San Francisco for nearly four decades and are a trusted partner for clients throughout the Peninsula.</p>
 <p>Public engagement lead</p>	<p>Winter Consultants is a certified DBE, Bay Area-based community engagement firm with a decade of experience and a diverse, multilingual team. They specialize in inclusive outreach strategies to achieve meaningful, equitable outcomes, and have built trusted relationships with communities across San Mateo County.</p>
<p><b>SFEI</b></p> <p>Environmental advisor</p>	<p>San Francisco Estuary Institute is a nonprofit environmental research organization delivering science that supports clean water and resilient ecosystems across the Bay-Delta and beyond. SFEI provides expertise in developing cost-effective, science-based solutions for environmental challenges.</p>



## Our Approach

We recognize the challenges to deliver an integrated transportation network given constraints of the natural and built environment, and the complexity of the surrounding infrastructure. Here are key areas of our approach that we see as essential to success:

### Integrated Planning | Creating High-Performing, Multi-Purpose, Essential Infrastructure

This project requires multidisciplinary expertise to develop integrated design solutions that meet the City's goals. Only delivering on some objectives, such as connectivity, but failing on others such as nature-based climate solutions, will lead to lopsided results that satisfy some priorities and leave others behind. Our team brings a holistic perspective, direct knowledge of the study area, and a steady hand to ensure intended outcomes are achieved.

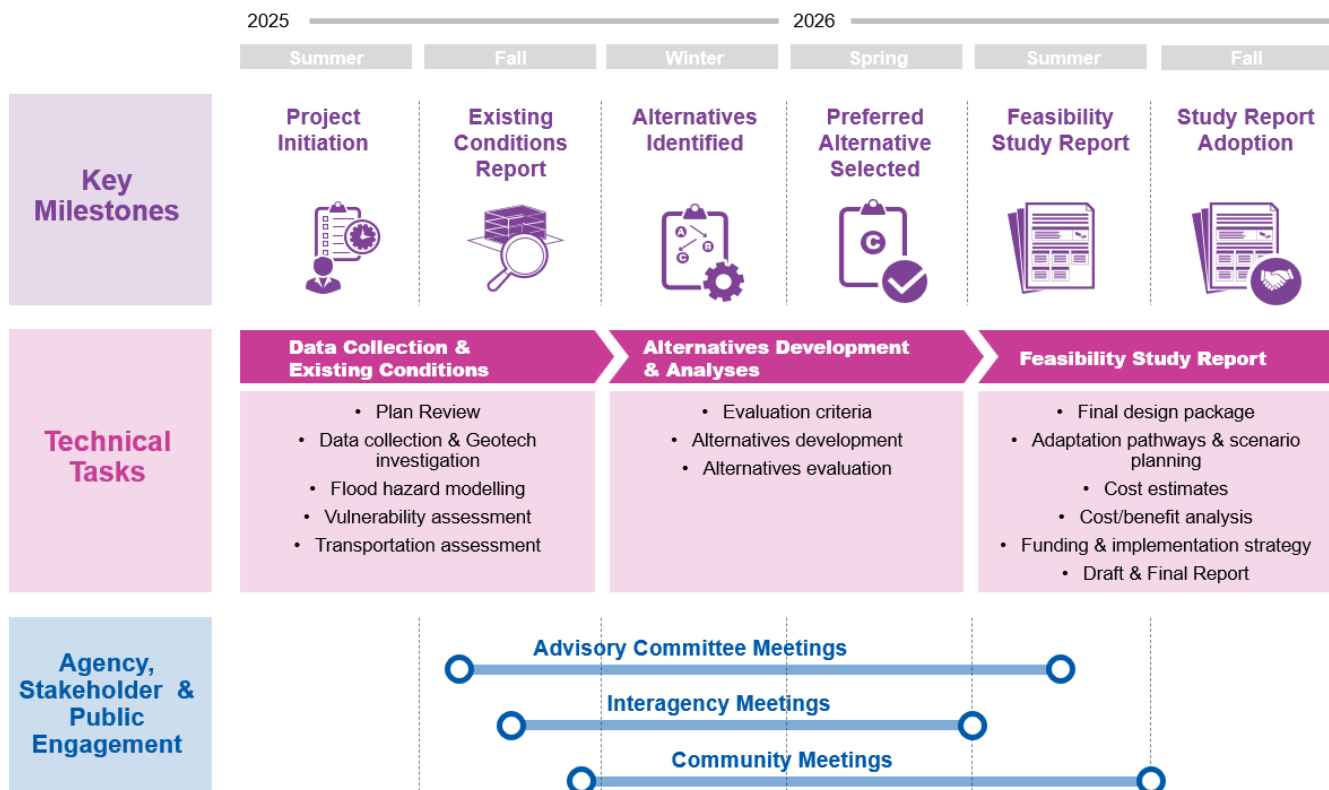
### Strategic Engagement | Fostering Accessible and Meaningful Dialogue

Meaningful engagement is paramount for this study, as the alternatives and preferred design must be versatile, serving diverse needs and requirements. We will collaborate with City staff and partner agencies

to navigate complex and sometimes competing priorities that must be addressed. We also recognize that engaging the public for a planning horizon that many may not live to see themselves compels us to be strategic and creative in our outreach, using accessible language to ensure everyone can participate in shaping the future of their shoreline.

### Safeguarded Delivery | Ensuring Successful Implementation

We will draw upon our global experience to bring best practices for successful project delivery. For example, in New York we developed a toolbox of green infrastructure solutions that have arisen because of the city's response to Superstorm Sandy. In Boston, we gained consensus from 16 different property owners on a flood resilience strategy that will safeguard the Wharf District, while preserving history and carefully incorporating nature-based solutions. From integrating the myriad technical elements to building consensus around major change, we understand how to deliver these complex projects so that cities can deliver feasible, resilient infrastructure.



### Key milestones, plan tasks and public engagement touchpoints



Project  
Understanding



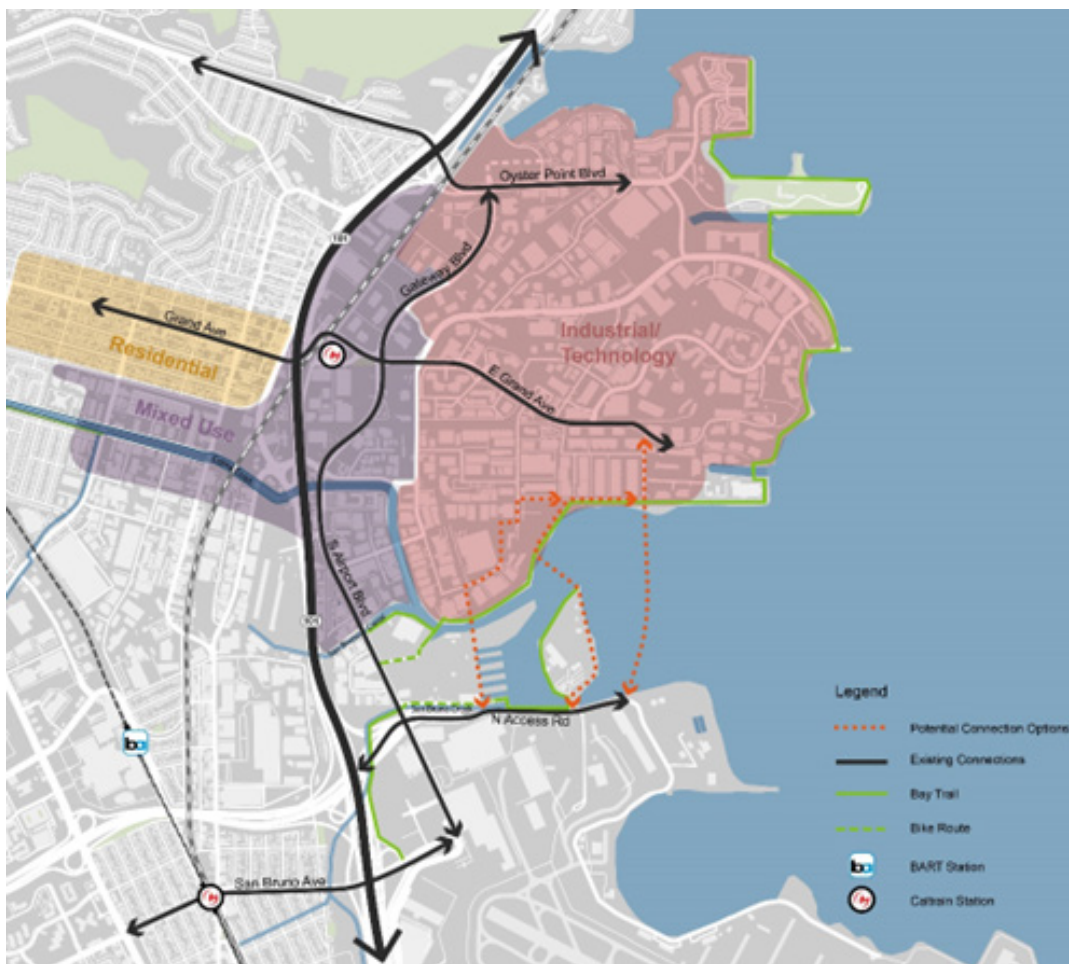
## Project Understanding

The development of the South San Francisco shoreline has a long and transformative history, evolving from tidal marshlands and a landfill into a significant biotech hub and a mixed-use waterfront destination. While substantial public and private investment has positioned the East of 101 area as a premier biotech and R&D hub on the peninsula, its continued growth hinges on effectively addressing the long-term threat of sea level rise and persistent transportation network constraints.

The South San Francisco Shoreline Protection and Connectivity Project is a critical step forward to address these issues through the following goals:

- Protect critical infrastructure and communities from rising flood risks due to sea level rise
- Enhance regional transportation connectivity
- Improve emergency access
- Close critical gaps in the bicycle and pedestrian network and enhance public access to the shoreline

These goals will be achieved through the conceptual development of a new roadway connection along the South San Francisco shoreline, designed to function as both a multimodal transportation link and a sea level rise adaptation strategy. This study will identify viable solutions for future design and construction phases.



**Connectivity throughout South San Francisco and surroundings. Study area depicts potential corridor options.**



## Vision

We see this project as a catalyst for multiple opportunities that will support sustained development in the East of 101 area and fostering a more connected, resilient community along the city's shoreline. Our approach is guided by the following themes:

Confluence	Connection	Community	Confluence
Deliver technically sound, financially viable solutions that seamlessly integrate sea level rise adaptation and mobility strategies.	Enhance multimodal access and connectivity to the East of 101 area, and improve the comfort and ease of walking, biking, and recreation along the shoreline.	Effectively engage with stakeholders and the public to ensure informed participation and cultivate strong support for the study recommendations.	A catalyst for next-generation design, embodying visionary work that aligns seamlessly with the South San Francisco General Plan.



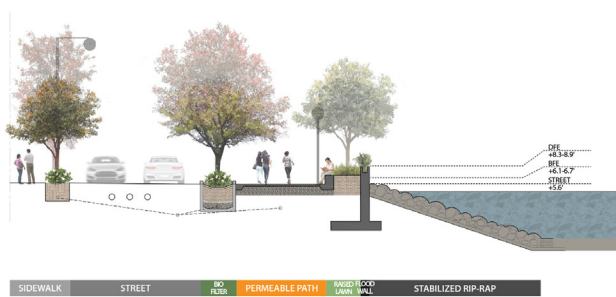
## Confluence

**Study Goal: Deliver technically sound, financially viable solutions that seamlessly integrate sea level rise adaptation and mobility strategies.**

This project is complex; it represents a confluence of urban issues, like mobility and development in the context of sensitive bay habitats, and climate change, where the threat of sea level rise necessitates bold action to ensure a resilient future.

### Delivering Technical Excellence and Feasibility Design

To develop viable combined transportation and flood protection structures requires extensive technical analysis and the expertise to navigate the complexities of the site area, particularly given the proximity to SFO and hydraulic connectivity to inland watersheds (e.g., Colma Creek). We anticipate challenges in navigating the tradeoffs between the location of effective flood protection measures, enhancement of local habitats, and improvement of mobility between North Access Rd. and Oyster Point. Our team has experience navigating similar tradeoffs in our sea level rise adaptation work for the Transportation Authority of Marin, where Arup and WRT worked collaboratively to identify feasible solutions to transportation and sea level rise issues at key areas at risk across the county. For South San Francisco, we have brought together experts with experience bringing planning into design, covering expertise in hydrological and hydraulic modeling, coastal infrastructure engineering, climate risk analysis, and geotechnical investigation to put the best minds to the issues at hand.



**Cross-section from Arup's work on TOD along Kapalama Canal in Honolulu, HI that brings together technical sea level rise adaptation strategies and mobility solutions along vulnerable shoreline.**

### In Partnership with Nature

The mouth of Colma Creek into the bay creates important mudflat and tidal marsh habitat, some of the only area in the immediate vicinity given the industrial land uses of the surroundings. Nature-based approaches can provide significant benefits, not just to plants and wildlife, but to the community who explore habitat areas along the shoreline, which will be important to fold into the solutions developed given the Bay Trail's path through the study area. We have high confidence in being able to develop holistic solutions that incorporate approaches in partnership with nature, as we have a proven track record from work on the SF Bay Trail Risk Assessment and Adaptation Prioritization Project and partnering with SFEI, who developed the Bay's Adaptation Atlas and identified nature-based solutions applicable along all stretches of shoreline.

### Agency & Regional Coordination & Compliance

Seamless integration with other sea level rise adaptation measures planned by neighboring jurisdictions is crucial to avoid conflicting or duplicative efforts. Our team works with local agencies (San Mateo County Transportation Authority, C/CAG, OneShoreline, and Caltrain) and communities (San Mateo, East Palo Alto, North Fair Oaks, Redwood City), bringing our familiarity with key partners to this effort and the ability to jump right into the complexity without requiring timely upfront relationship building.

We have extensive experience on sea level rise adaptation planning in the Bay Area, and we support regulatory agency BCDC with their technical program to support jurisdictions developing their Regional Shoreline Adaptation Plans (RSAPs).



## Connection

**Study Goal: Enhance multimodal access and connectivity to the East of 101 area, and improve the comfort and ease of walking, biking, and recreation along the shoreline.**

### Supporting Future Growth by Addressing Mobility Deficiencies

Limited access to the East of 101 area presents significant challenges for daily travel, emergency access, and evacuation. The City's General Plan anticipates substantial growth in this area, which is projected to exceed existing vehicle capacity and faces significant transportation hurdles. Despite the City's robust efforts to mitigate new vehicle trips through comprehensive TDM strategies and transit service, access and capacity remains severely limited. The pedestrian and bicycle network face similar connectivity challenges. Access to the Bay Trail and waterfront is difficult to navigate to, and requires travel along busy streets like Airport Boulevard.

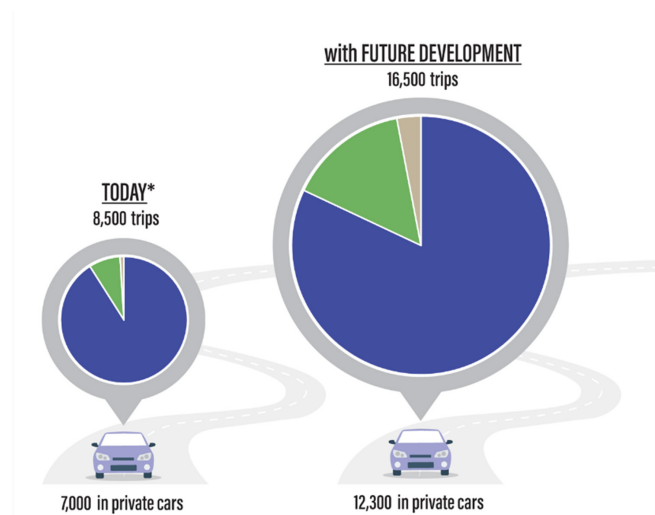
To address these issues, we will work with the City to establish a new roadway connection via the proposed Haskins Bridge that achieves multiple purposes:

- Enhances overall connectivity between Oyster Point and the rest of the city
- Creates redundancy in the transportation network
- Diverts auto/freight trips away from the Oyster Point Boulevard and Grand Avenue interchanges
- Provides a more comfortable and seamless experience for people to walk, bike, and recreate along the shoreline

While the bridge is intended to expand vehicle capacity into the East of 101 Area, it is part of a broader mobility strategy for South San Francisco. Our approach will effectively integrate with other mobility initiatives, and carefully consider the impact on overall traffic patterns and mode shift. We will establish priorities and metrics to evaluate different alternatives to make sure we're delivering on the City's goals regarding economic growth, transportation, and sustainability.

### Financial Viability

While the Haskins Bridge connection will need to serve many purposes, it's essential that it be financially viable to construct. For instance, a wider bridge, while potentially improving capacity, could dramatically increase costs. We will engage our Bridges and Cost Estimating teams early to pinpoint the most important financial considerations.



**Anticipated growth from Oyster Point Mobility Vision Plan (Arup)**

## Community

**Study Goal: Effectively engage with stakeholders and the public to ensure informed participation and cultivate strong support for the study recommendations.**

### Communicating Complex Technical Information

While the idea of sea level rise may be commonly known, the science behind it can be hard to grasp. To meaningfully engage with the community, communications need to be clear and accessible to everyone, regardless of their background or technical understanding. Our team will communicate clearly and credibly with the public. We will simplify complex information while maintaining expertise and credibility. We'll use plain language, provide source links for those who prefer to deepen their learning, incorporate visuals, and be transparent yet judicious with information shared.

### Reaching Diverse Community Members

Engaging Bay Area communities, especially in the diverse South San Francisco community, can be challenging due to language and cultural barriers. Our team's shared lived experiences and native language proficiencies uniquely qualify us to overcome these. All materials will be provided in English and Spanish at a minimum, and potentially Tagalog, Simplified Chinese, and other languages identified in coordination with City staff. Our team will host engagement bilingual English/Spanish engagement events and offer language and other accessibility accommodations as needed.

### Generating Public Interest

Because this is a long-term initiative in a less visible part of the city, it might not immediately grab the attention of most residents or be a top priority to engage on. Opportunities for addressing this challenge include:

- Re-engage past contributors: Connect with community members who participated in related efforts, like the Lindenville Specific Plan and Colma Creek Adaptation Plan.
- Strengthen community ties: Build on existing relationships with schools and childcare facilities (e.g., SSF Boy's and Girl's Club), Parks & Rec programs, and local groups such as the SSF Mother's Club, SVBC's North San Mateo County advocacy team, and Rise South City.
- Generate excitement: Help residents visualize how improved connections can open up new shoreline access and recreational opportunities.
- Partner with local organizations: Collaborate with businesses like SSF Scavenger to integrate engagement into existing school field trips, Costco to promote meetings and surveys at their nearby location, and Gymtowne to reach families who bring their kids to the east of 101 area regularly and may have a unique perspective on the area.
- Leverage the City's expanding and evolving social media presence.





## Catalyst

**Study Goal: A catalyst for next-generation design, embodying visionary work that aligns seamlessly with the South San Francisco General Plan.**

The surrounding area has seen a remarkable transformation over recent decades, evolving from a former waste disposal site into a vibrant life science and office campus. This achievement stands as a testament to diligent long-term planning and investment. Our work will build upon this foundation, ensuring alignment with the General Plan's vision for the East of 101 innovation district.

However, this moment calls for more than just continued development. We see an extraordinary opportunity to design for Transit-Oriented Development, champion active transportation and shoreline access, and embrace nature-based solutions. This project can fundamentally redefine perceptions of Oyster Point, transforming it into a dynamic gathering place that seamlessly connects with Colma Creek and the wider community.

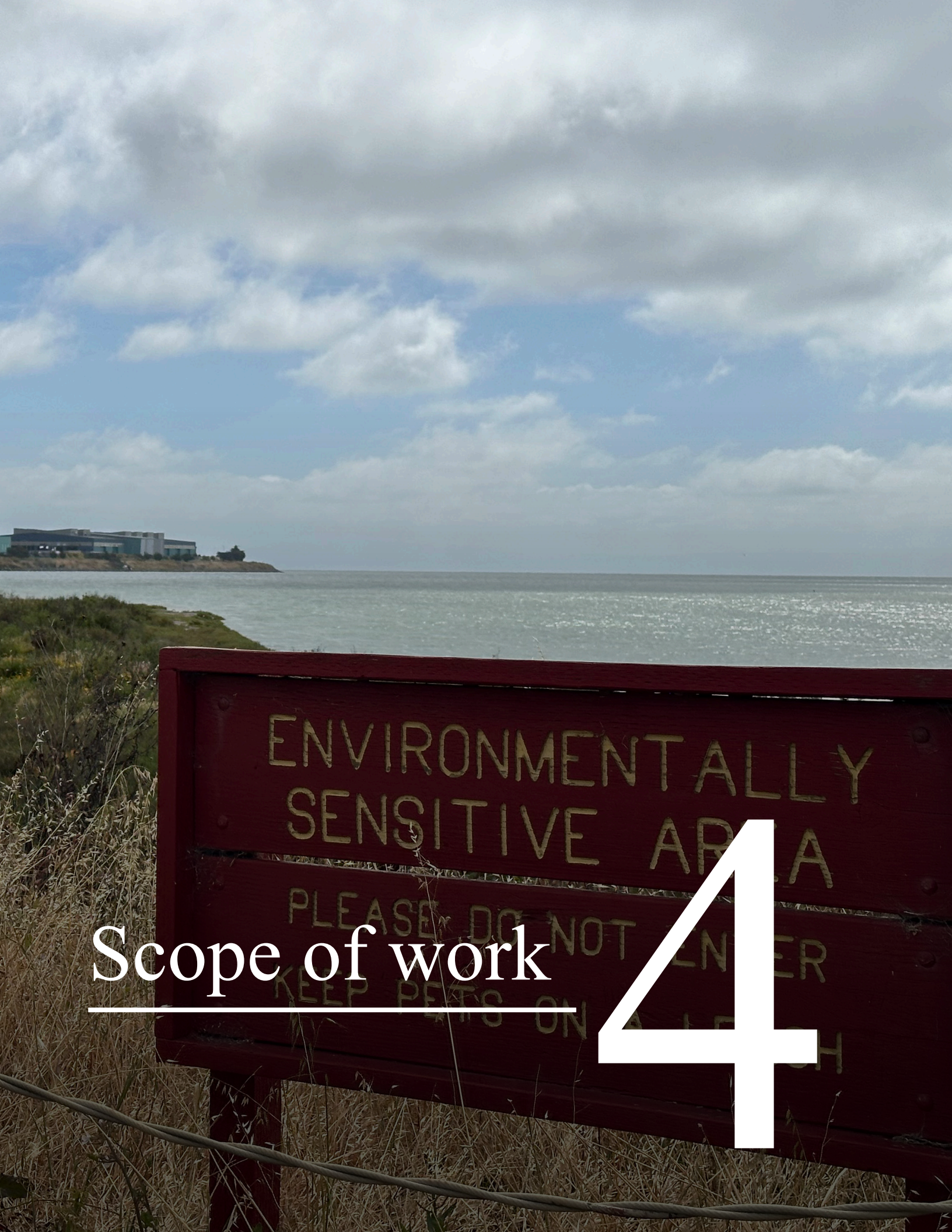
Our team will facilitate an innovative and ecologically-driven approach that is designed for long-term sustainability through the following strategies:

- Bring inspiring ideas, identity, and narrative to the project by weaving the social, ecological, physical, and historical context into compelling visuals that engage stakeholders and the public.
- Facilitate dialogue across agency partners and stakeholders to understand specific needs and share problem-solving expertise.
- Provide information and education about nature-based solutions and hybrid systems to help community members understand the challenges and make informed choices.
- Generate phased, adaptive solutions that can evolve over time as funding becomes available.

We will bring this holistic, human-centered approach to the Shoreline Study to unlock solutions that truly reflect and elevate both City and community priorities, creating a legacy for generations.







Scope of work

4



## Proposed Modifications

Based on our review of your requested scope of work, we identified key opportunities to streamline the overall process and better integrate the various technical work streams. Specifically, we've proposed modifications that consolidate certain tasks, eliminate redundancies, and optimize the sequencing of activities in Tasks 2 – Existing Conditions, Task 3 – Technical Analyses and Alternatives Development, and Task 6 – Feasibility Report.

## Compliance with Grant Funding Requirements

We also understand the critical importance of adhering to your funding requirements from Caltrans and Ocean Protection Council. Please be assured that our proposed work plan is designed to fully support the documentation needs for your multiple funding sources, ensuring alignment with the original grant agreements. We will work closely with City staff to produce all necessary deliverables, reports, and financial documentation in the formats and at the intervals required by each grant. Our aim is to make this process as seamless as possible, allowing City staff to focus on the project's core objectives with confidence in your compliance.



**Pedestrian bridge along Bay Trail near the Costco Wholesale, just west of the study area (WRT).**

## Task 1: Project Management

### 1.1 Project Initiation & Ongoing Management

#### *Kick-Off Meeting*

At the project's inception, the Arup team will convene a kickoff meeting with City staff to review goals, key issues, milestones, and deliverables. During this meeting, we will introduce the full team, confirm communications protocols, and clarify the City's project management and administrative expectations.

#### *Project Team Meetings*

Our Project Manager and key staff will facilitate regular project team meetings through the duration of the project. We propose meeting on a bi-weekly basis to discuss active and upcoming tasks. We will provide agendas, relevant materials, and summary notes that capture action items, discussion topics and decision-points.

#### *Progress Report & Invoicing*

Arup will submit monthly invoices and progress reports that document the status of deliverables, upcoming work, and the project budget.

#### *City Council Meeting*

We will prepare and deliver a presentation to the City Council near the conclusion of this work to present project findings and deliverables.

#### **Task 1 Deliverables:**

- Kick-off meeting, including agenda preparation and facilitation
- Regular check-in meetings, including agenda preparation, facilitation and meeting notes
- Monthly progress report and invoice
- Project schedule updated monthly
- Hours budgeted for City Council Meeting preparation and time to present

## Task 2: Data Collection and Existing Conditions

### Task 2.1 Plan Review

There has been extensive work completed at the local and regional level that will directly inform this study. Our investigation will begin with a review of documents and data that relate sea level rise, land use and transportation. This review will establish a shared understanding of the latest planning, projects, existing conditions data, and climate science that will inform the project alternatives and design process. We will provide a summary of the available data and key takeaways, with a lens towards minimizing data collection duplication.

As a starting point, this review will include the following documents, which are included in Figure 1 to illustrate how we ensure that the work is aligned with all levels of existing guidance and best practices, scaling bottom-up from City-wide guidance and standards to county, region (broader Bay Area), state, and national resources in alignment with global efforts led by the Intergovernmental Panel on Climate Change (IPCC).



**Pedestrians on the Bay Trail in South San Francisco (WRT).**

As a starting point, this review will include the following documents:

#### *City Data, Plans & Studies*

- Shape SSF 2040 General Plan, including Lindenville Specific Plan (2022, 2023)
- Active South City Pedestrian and Bicycle Plan
- Colma Creek Restoration and Adaptation Project (2024)
- Storm Drain Master Plan
- City Zoning Ordinance
- South San Francisco Climate Action Plan (2022)
- Concurrent studies and development projects

#### *County-Level Data, Plans & Studies*

- OneShoreline Planning Policy Guidance (2023)
- Sea Level Rise Policy for County-Owned Assets
- Assessing Nature-Based Shoreline Protection Strategies for San Mateo County
- SamTrans Adaptation and Resilience Plan
- Caltrain Climate Change Vulnerability Study
- SFO Infrastructure Resilience Framework
- SFO Shoreline Protection Program
- Climate Ready portal for San Mateo County
- San Mateo Sea Level Rise Assessment (2018)

#### *Regional Data, Plans & Guidelines*

- BCDC Regional Shoreline Adaptation Plan Guidelines (2024)
- Bay Adapt: Regional Strategy for a Rising Bay Joint Platform
- Bay Trail SFO Gap Study & Bay Trail Design Guidelines
- Our Coast, Our Future (OCOF) data (United States Geological Survey, USGS) (2021)
- Adapting to Rising Tides (ART) data

#### *State & Federal Data & Guidelines*

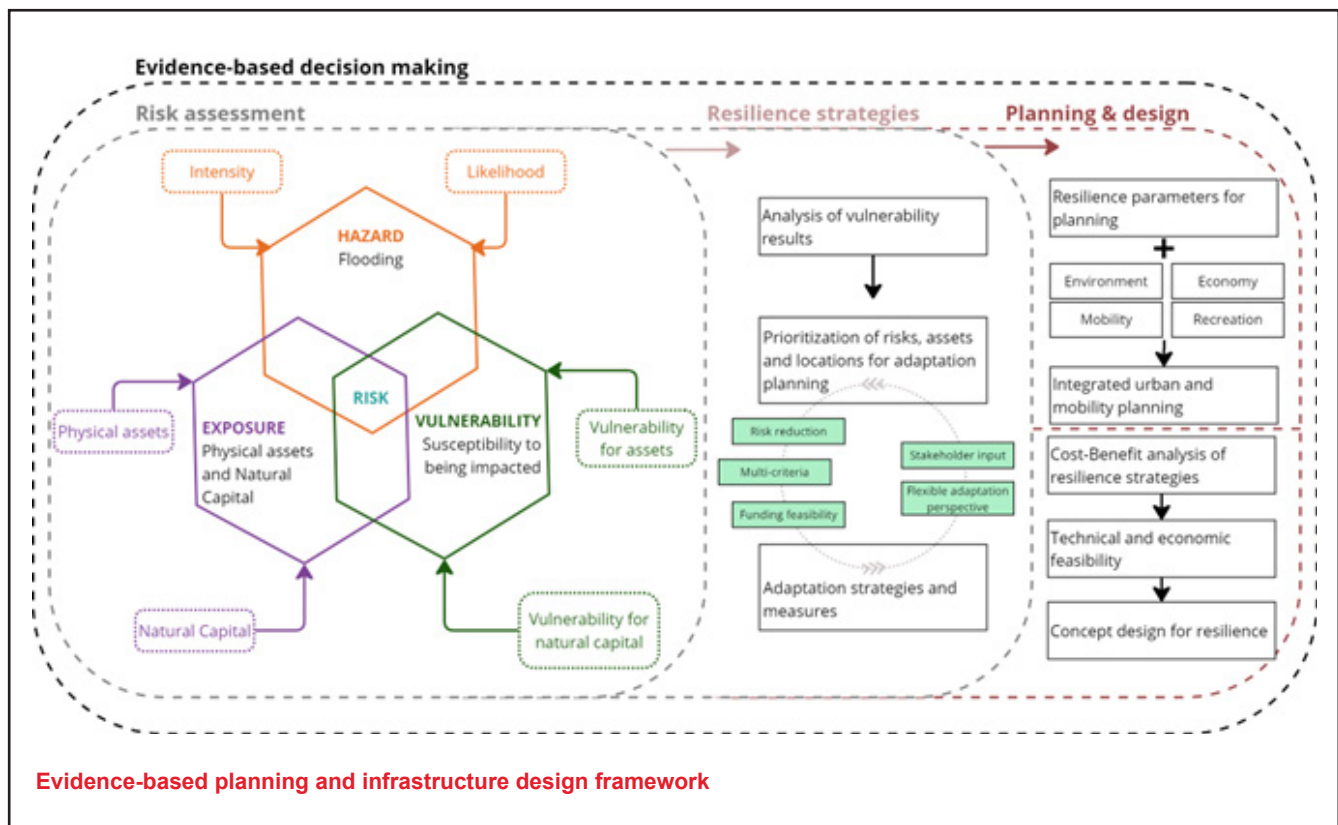
- Ocean Protection Council California Sea Level Rise Guidance (2024)
- Federal Highway Administration (FHWA) Nature-Based Solutions for Coastal Highway Resilience: An Implementation Guide
- California Fourth and Fifth Climate Change Assessment, including Cal-Adapt data portal



## Task 2.2 Vulnerability Assessment

For this task, we will conduct an assessment of the flooding risks to existing property and transportation infrastructure within the study area. Drawing on local, regional, and state-level utility plans and climate adaptation strategies, this analysis will evaluate vulnerabilities across the multiple drivers of flooding including coastal flooding (considering tidal, storm surge, and groundwater inundation), extreme precipitation, and riverine flooding. The findings of the assessment will inform resilience strategies that align with projected climate scenarios and evolving mobility and urban development through the analysis of the alternatives. As shown in Figure 2, by combining our expertise in climate risk and in the development of resilient infrastructure and the built environment, we are able to directly use these results to inform or feed into the planning and engineering processes to plan, design and enhance assets and infrastructure.

“ In our approach, the risk of natural hazards worsened by climate change is a key determinant for all planning and design activities, as it is crosscutting across all dimensions including land use planning, urban design, placemaking, asset and infrastructure design and strategic planning and economic development.



The risk assessment will use high resolution hazard data coupled with qualitative infrastructure and property vulnerability to assess risk at a parcel or district level. Our proposed methodology will include the following components.

### Physical Setting

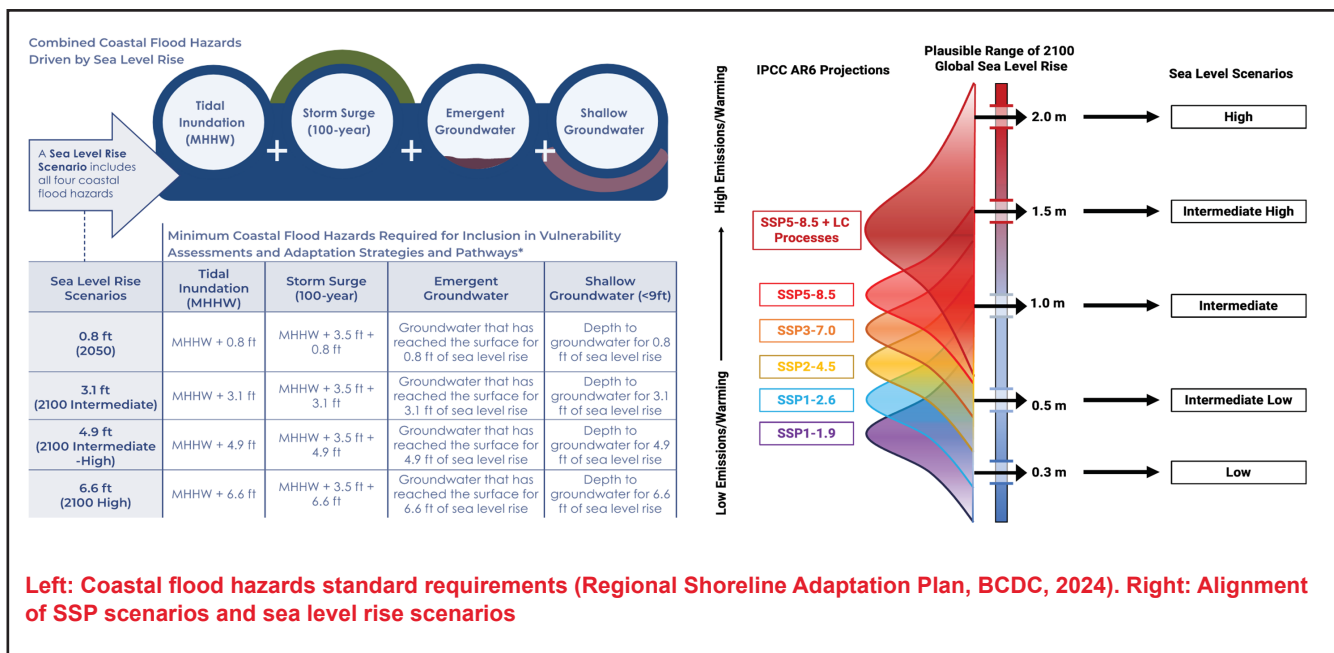
We will conduct a thorough desktop review of all available information on site conditions including existing topographic, bathymetric, geotechnical and other site information. We will review information from sources such as from the US Geological Survey (USGS) and National Oceanic and Atmospheric Administration (NOAA) and building on the findings from Task 2.1. By leveraging this existing documentation, our team will review the identified gaps and gather any necessary additional data to inform feasibility analysis of proposed alternatives for protection and transportation.

We will plan and perform a site-specific field investigation to collect necessary data needed for engineering analyses and design. We will develop a Geotechnical Investigation work plan detailing exploration locations, methods, and goals. This investigation may include Cone Penetration Testing (CPTs), exploratory boreholes, in-situ testing, installation of groundwater monitoring wells or devices, field permeability testing, and laboratory testing of soil and rock samples. All field works

and laboratory testing efforts will be conducted by an appointed geotechnical drilling and testing subcontractor, Taber. The data produced from this investigation will allow us to supplement the findings from the desktop review with site-specific information and build up a more complete picture of site conditions. This data will be used by engineers to inform engineering decision making and conceptual design of feasible structure types and locations for flood protection measures and transportation solutions.

### Flood Hazard

We will use the existing data from tide gauges, such as at Oyster Point Marina (NOAA station 9414392), and precipitation data from NOAA Atlas 14 and the weather station at San Francisco International Airport to conduct a probabilistic flood hazard assessment of existing conditions. We will develop a storm event set which includes storm surge and precipitation data for more frequent (10-year and 25-year return period) and infrequent (50-year, 100-year and 500-year return period) events.





Available topography data and hydrologic and hydraulic models from previous studies (such as the hydrology and hydraulics model from the Colma Creek Restoration and Adaptation project and the San Bruno Creek Resiliency Study) will be requested. Federal Emergency Management Agency Flood Insurance Rate Maps and hydrologic modeling with maps of inundation extents will also be collected. This data will be complemented with existing local modeling from Adapting to Rising Tides (ART), USGS (Our Coast, Our Future), and the Storm Drain Master Plan. Site-specific modeling may be conducted building off existing HEC-RAS or similar models as needed, to capture the combined effects of riverine and coastal flooding mechanisms. Urban drainage systems will conservatively be assumed to be at capacity and not accept additional runoff. The flood model for the existing conditions will provide flood depths and extents which represent the baseline hazard, and the model will be modified under Task 3 to analyze the effectiveness of the proposed alternatives. Existing and proposed flood protection systems from nearby agencies will be evaluated.

To incorporate climate change, we will model sea level rise scenarios according to regional BCDC guidance, model future storm events using climate-adjusted precipitation values and groundwater rise, aligning the scenarios for sea level rise with the SSP scenarios used for precipitation data (for the stormwater and riverine analyses), following the equivalencies provided by BCDC (shown in Figure 3). The rainfall input will be modified to account for the projected changes using a simple statistical downscaling technique applied to the climate data used in California 5th Climate Change Assessment (LOCA2). We propose using one climate scenario for 2050 and up to two scenarios for 2100 (e.g., SSP5-8.5 for 2050; SSP2-4.5 and SSP5-8.5 for 2100), finalized in discussion with the City. Pathways Climate Institute and SFEI data on groundwater conditions will be utilized to modify infiltration rates to reflect anticipated groundwater rise impacts.

### ***Risk Assessment***

We will determine the exposure of land, infrastructure, and buildings to inundation from the storm events through a GIS exercise. The vulnerability of exposed assets and areas will be assessed through desktop exercise, characterizing their key physical attributes, functions, and populations served, and the risks to them identified (i.e., how critical services and functions could be threatened). Specifically, the team will focus on four areas to assess risk.

- **Commercial/industrial and recreational uses:** We will identify and characterize the different land uses in the area by conducting desktop research (Task 2.1) and collecting stakeholder input via workshops and surveys. Potential impacts to the commercial and industrial land uses on Oyster Point and also the SamTrans bus yard and water treatment plant on the western edge of the study area, will be assessed as will the recreational areas along the Bay Trail and other land uses in the area will be identified.
- **Environmental context:** The findings from nearby efforts and feasibility studies reviewed in Task 2.1 will inform understanding of the study area's habitats and ecosystem functions. The impacts of their exposure to SLR and flooding will be qualitatively assessed and documented.
- **Physical infrastructure exposed:** Using publicly available data from city, county, and regional sources, we will map the buildings, roads, and other infrastructure assets. Their exposure to SLR and



**The environmental context shapes the vulnerability of South San Francisco and also presents opportunity for sea level rise adaptation.**

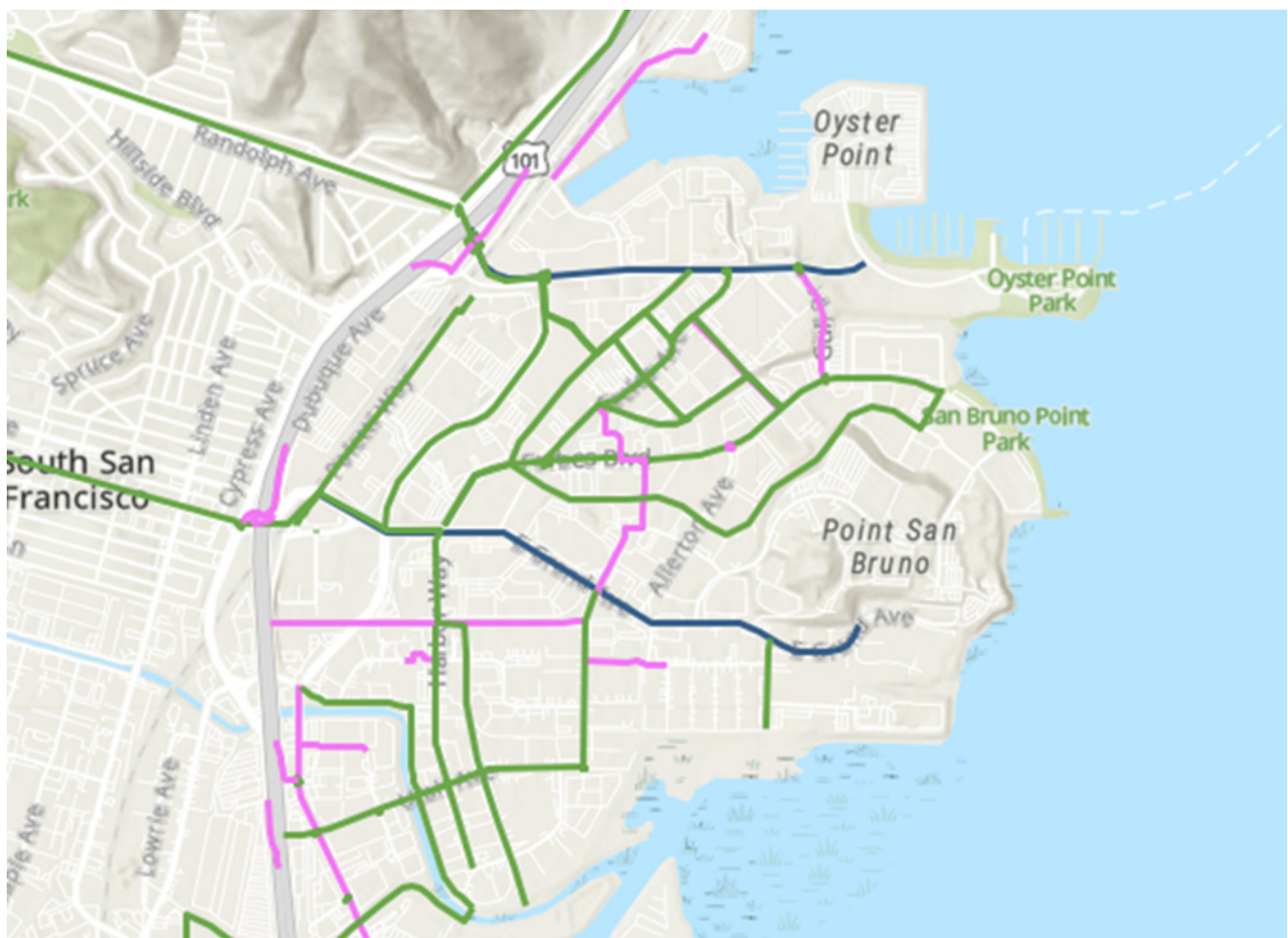
flooding will be captured through GIS analysis, and their vulnerability to flooding assessed qualitatively.

- **Transportation:** Key roads and trails will be assessed for sea level rise and coastal hazards risks, including North Access Rd along the southern portion of the study area and the Bay Trail throughout the area. Impacts to access to the SamTrans bus yard and SFO facilities will be identified, and other mobility needs identified through Task 2c Transportation Assessment.

### **Task 2c Transportation Assessment (RFP “Task 2a: Data Collection and Existing Conditions – Transportation”)**

For this task, the Arup team will conduct analysis to identify current and future conditions across the transportation network. This assessment will draw heavily from relevant documents reviewed in Task 2a, site review and field reconnaissance, data collection, and analyses. It will also be informed by input from the Advisory and Interagency Committees.

Note that this sub-task encompasses the work requested in the RFP under Task 2a Data Collection and Existing Conditions – Transportation.



**The Oyster Point Mobility Vision Plan includes a range of multimodal improvement projects. Source: Arup**



### ***Vehicles and Freight***

Led by Fehr & Peers, we will document existing roadway conditions in the East of 101 Area and North Access Road corridor. We will analyze current and future traffic conditions in the East of 101 Area, using the city's subarea model and C/CAG model to develop forecasts, and assessing existing roadway capacity to identify the need for additional connections.

### ***Active Transportation***

The study area includes sections of the Bay Trail and other on-street active transportation facilities. We will provide an overview of the existing and proposed pedestrian and bicycle network, and a summary of issues and opportunities regarding network conditions, including safety, network gaps/connectivity, and access.

### ***Transit (Ferry, Bus, Train, Private Tech Shuttles)***

This will entail a comprehensive overview of the current and proposed transit services and routes and will identify all relevant facilities and yards. We will summarize potential issues and opportunities related to future transit services, that may be provided in the future as land uses evolve and expand.

### ***Data Collection, Modeling and Analysis***

This task will start with the collection of 72-hour screenline tube counts to illustrate existing midweek roadway utilization during peak periods. Counts will focus on the four connections into the East of 101 Area east of Gateway Boulevard (Oyster Point Boulevard, East Grand Avenue, Utah Avenue, and Mitchell Avenue) as well as North Access Road east of the I-380 interchange. The counts will identify vehicle class to infer truck volumes at each location.

Following these counts, Fehr & Peers will prepare charts to summarize travel by time of day and calculate peak hour volume to capacity (V/C) ratios for each. We will compare counts against comparable historical data where available to assess how conditions have changed between pre- and post-COVID. Previous traffic studies suggest that midweek traffic volumes have recovered to pre-COVID levels as reductions in travel demand associated with remote work have been mostly offset by East of 101 Area development activity, so the pre-COVID model base year (and associated plots of volume, V/C, and LOS) remains suitable for a high-level snapshot of existing traffic conditions.



**Rendering from the Oyster Point Mobility Vision Plan. Source: Arup**

Fehr & Peers will update the future base year “no project” scenario using the city’s subarea model and C/CAG model to reflect the latest version of the C/CAG model that incorporates Plan Bay Area 2050 regional forecasts, while maintaining the city’s General Plan buildout forecasts. We will coordinate with City staff to assess which transportation improvements would be included in the future base year subarea model for purposes of this study (for example, including the Utah Avenue overpass that is proceeding through Caltrans approvals, but excluding the more speculative roadway connection between Oyster Point Boulevard and Sierra Point). Adjustments to the model will be documented in a brief technical memorandum with one round of consolidated comments from city staff.

Fehr & Peers will document future base year conditions including plots of volume, V/C, and LOS. Accompanying these metrics will be an assessment of area-wide roadway capacity and a discussion of stress-testing capacity based on continued changes to travel behavior and land use conditions. We will also note how truck volumes may change as life science continues to expand and warehouse uses remain concentrated in the southern half of the area. This analysis will expand upon the 2040 General Plan findings that even after maximizing TDM and minimizing parking, some additional roadway connection may be necessary beyond the four existing gateway connections.

### **Task 2.4 Existing Conditions Report**

Findings from the vulnerability and transportation assessments will be compiled into a “baseline conditions profile” that will establish a common, shared understanding of existing conditions, deficiencies and needs, and key opportunities that will be incorporated for study in subsequent tasks. The profile will be presented as a summary report using both narrative descriptions and supporting visuals

### **Task 2 Deliverables:**

- Plan review summary
- Existing Conditions, Transportation Assessment, and Vulnerability Assessment Report (Draft and Final).



## Task 3: Technical Analyses and Alternatives Development

### Task 3.1 Goals and Evaluation Criteria

The Arup Team will work collaboratively with City staff to develop a set of evaluation criteria, heavily drawing on the City’s established policy guidance (reviewed in Task 2) to align study goals with work to-date. This work will be shaped by input from the Advisory Committee and the public through outreach and engagement activities (Task 4). As a baseline, we will include criteria to assess modal priorities, flood protection technical feasibility, cost effectiveness, environmental impacts, and level of community support. We will integrate community priorities, balancing lived experience with technical rigor. This will culminate with a straightforward framework that will incorporate clear criteria for prioritizing community input, measuring alignment with project goals, and evaluating feasibility, scalability and equity outcomes, such as the example framework shown in Figure 4. It’s important to remember that the weight of each of the criteria is not always equal, and their importance can shift depending on the specific circumstances.

### Task 3.2 Alternatives Development

Understanding the range of technical parameters is crucial for developing effective sea level rise adaptation solutions. Factors like flood risk, water quality, utility capacity, mobility, accessibility, stormwater runoff, soil conditions, and ecological capacity all impose significant constraints—and present unique opportunities—when we are identifying alternatives that meet social, economic, and community needs.

In this task, we will use key technical parameters to develop a toolbox of strategies and use this toolbox to build out the conceptual alternatives. Our team’s expertise will guide the development of these alternatives, ensuring they incorporate both “gray” (engineered) and “green” (nature-based) adaptation strategies. We will build on strategies and work identified through existing studies, projects, and plans in Task 2, particularly along Colma Creek and around SFO, to ensure our the alternatives developed integrate with ongoing work and planning along the shoreline.

Category / score	Cost	Effective-ness	Time to Implement	Social Impact	Complexity	Co-Benefits	Environ-mental
1	Expensive	Limited	Years	Negative (-1)	Highly complex	Minimal	Negative (-1)
2	Moderate	Moderate	Months	Negligible (0)	Moderate	Moderate	Negligible (0)
3	Inexpensive	High	Immediate	Positive (1)	Low Complexity	High	Positive (1)
Weighting	20%	20%	10%	10%	20%	10%	10%

Example framework for a multi-criteria evaluation

As part of this process, alternatives will be further developed through a collaborative charrette process with the Advisory Committee and other key stakeholders by exploring opportunities in the study area that address the issues identified in the assessments and meet project objectives. The outcome of this process will be 3-5 distinct conceptual alternatives, each designed to explore the City's goals for adaptation, land use, mobility, and open space.

The following figure is an example of how we might work through the range of proposed adaptation solutions to support charrette conversations as part of the alternatives development process. Synergies and trade-offs will be evaluated in Task 3.3, using the multi-criteria evaluation framework set up in Task 3.1.

### **Project Definition**

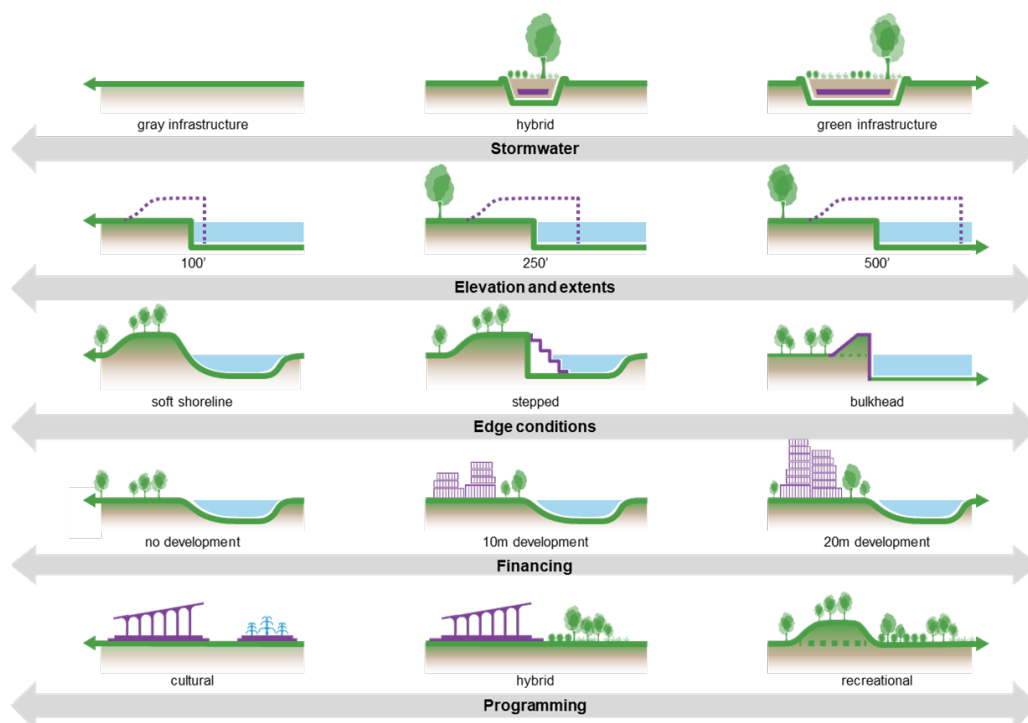
For every alternative, we will document and present the evaluation findings in a Profile Summary. This summary will detail the alternative's key attributes, including:

- **Alternative name:** Memorable and descriptive name to refer to the alternative in materials developed.

- **Summary description:** A concise overview of the proposed interventions related to adaptation, land use, mobility, and open space. Written narratives will include a description of Regional Shoreline Adaptation Plan (RSAP) compliance
- **Indicative performance score:** A score for each evaluation criteria, as described in the subsequent task.

To effectively convey the technical parameters and tradeoffs for each alternative, we will prepare the following graphic materials:

- **Plan diagrams:** The plan diagram will show the location of strategies for each adaptation alternative.
- **Typical sections:** Two typical cross-sections will be hand drawn or developed in CAD for each alternative.
- **3-D study model views:** Perspective renderings will provide illustrative views of each alternative, and they are powerful in their ability to communicate understanding of the adaptation concepts. Two 3-D views will be developed for each alternative.
- **Precedent images:** Share examples from local to international shorelines that employ the strategies recommend as part of each alternative.



**Examples of potential adaptation strategies.**



These graphics will identify structures, roadways, and habitat opportunities including flood control structures, roadways, pumps, and drainage features to be represented. One round of review and refinement is assumed.

### **Task 3.3 Alternatives Analyses (including 3a Technical Analyses - Transportation)**

To evaluate proposed alternatives, Arup will use the multi-criteria framework from Task 3.1 to objectively compare the options, using both qualitative and quantitative data and indicators. One of the key quantitative metrics to use is an indicative cost-benefit analysis (CBA) that will provide a robust indicator to inform the selection of the preferred alternative. This should be a Rough-Order-of-Magnitude (ROM) CBA that is aimed at comparing and prioritizing, and not necessarily to provide a detailed and final financial analysis.

In terms of the flood protection interventions, the estimated benefits can be obtained from the counter-factual risk assessment, and this will be directly incorporated into the CBA and multi-criteria analysis, guiding the development of resilient adaptation strategies with the ‘least regrets’ approach. Additionally, we will conduct an Adaptation Pathways analysis at this stage to help visualize the time-bound advantages of the alternatives, and this will be used as part of the multi-criteria analysis to inform the selection of the preferred alternative. Our goal is to identify a future timeline of decision points and adaptation triggers, ensuring the study area is well-prepared for the challenges posed by climate change.

### **Transportation (including 3a Technical Analyses - Transportation)**

The alternatives will be evaluated for how they will affect travel patterns, operations, and performance for all modes. The evaluation methods will be determined by the criteria set in Task 3.1, which we anticipate will follow this framework:

- Vehicles and freight: travel patterns, operational and capacity issues, VMT impacts. A detailed approach to this analysis is provided below.
- Transit: anticipated ridership changes, accessibility improvements, travel time reliability, and operational efficiency.
- Pedestrian & bicycle network: network connectivity, route directness, safety, and comfort.

We assume that up to three roadway alternatives will be analyzed using the C/CAG model and city subarea model (for example, a two-lane bridge, a four-lane bridge, and a two-lane seawall street). Additional non-transportation alternatives may be evaluated by the team (e.g. a seawall or bridge with a Bay Trail extension) but are expected to otherwise exhibit similarities to the no-build alternative or these project alternatives.

We will document the effect of these roadway alternatives with plots of volume, V/C, and LOS. We will document changes in volume and traffic operations compared to a no-project scenario for each alternative, and map the trip distribution of each alternative within the traffic analysis zones in the East of 101 Area. In addition, we will analyze effects on total vehicle miles traveled and changes to area-wide roadway capacity. This analysis will be paired with a narrative documenting the potential upstream and downstream effects on traffic patterns and truck traffic, including flagging potential benefits and challenges (for example, some traffic may be diverted away from the Caltrain station area, but new pinch points emerging elsewhere).

### **Flood Protection**

For each flood protection alternative, we will describe the intervention typology, scope, expected effect on risk reduction and schematize conceptual designs, and will use the flood model developed in Task 2 to gain an understanding of the implications of the alternative. This analysis will qualify the benefits of taking action in terms of avoiding damages or disruptions.

### **Social and Environmental Considerations**

Our approach will aim to not only create social and environmental burdens, but to generate or support opportunities to advance social and environmental benefits. In our preferred alternative assessment, we will consider social and environmental impacts and opportunities by looking at solutions holistically. For instance:

- What does this tide gate mean for fish passage?
- Can this horizontal levee support expanded active transportation infrastructure for Equity Priority Communities (EPC)?
- What do improved tidal wetlands mean for bird habitat near SFO and what are the safety implications for airlines?

- How might this beach nourishment provide better access to nature for EPCs?

These are illustrative examples of the types of questions we will ask as we consider the opportunities and challenges of the alternatives to help refine our concept designs. These considerations will feed into the evaluation criteria defined in Task 3.1 for the social and environmental criteria.

### Task 3.4 Preferred Alternative Concept Design Plan

The Arup Team will refine the preferred alternative based on City direction after review and community input. The preferred concept may be a hybrid of explored options. In order to work towards this preferred alternative, we will conduct several team charrettes to gather the experts across disciplines and resolve tradeoffs and identify a preferred direction.

We will prepare a draft of an initial narrative and sketch diagram for the preferred conceptual alternative for review by the City. Once aligned, the Arup Team will prepare a graphic plan diagram, which contains:

- Two (2) typical sections (CAD)
- Five (5) study model views
- One (1) birds-eye perspective rendering
- Up to ten (10) precedent images



WRT renderings from the Evolving Shoreline Adaptation Study for Bothin Marsh. Source: WRT

For the Project Alternatives Report, a design package will be developed that summarizes the alternatives and the preferred concept. This deliverable will reference the goals, evaluation criteria, and advisory and community feedback through brief narrative and graphic content. It will contain a summary of RSAP alignment, such as an updated checklist and narrative. The Arup Team will submit an administrative draft of the report to City staff for initial review. Comments will be consolidated into a single comment log, for which Arup will provide a template.

### Task 3 Deliverables:

Draft and Final Project Alternatives Report

## Task 4: Public Outreach

### Task 4.1 Public Outreach Plan

As a first step in preparing for engagement and outreach for the project, the Arup Team (led by Winter Consulting) will develop an Inclusive Engagement Plan that outlines engagement efforts. The strategy will focus on community understanding, engagement goals, specific tactics, and an implementation plan aligned with the project schedule. This plan will include an overarching promotional strategy that considers community relationships to support broad-reaching communication. The plan will be flexible to accommodate community needs that may emerge through engagement efforts and plan development.



Engagement materials from the Sausalito Shoreline Adaptation Plan. Source: WRT



### Task 4.2 Project Website / Online Engagement

Throughout the duration of this project, we will maintain a project webpage that includes informational content, project updates, interactive engagement exercises, and an events calendar. The project webpage will be updated at the beginning of each phase to reflect the most accurate project information possible and include a short survey to gather community input. The webpage will also include translation tools to remain accessible to non-English speaking residents, and will be drafted to remain easy-to-access for community members with varying levels of technological access.

### Task 4.3 Community Meetings

The Arup team will lead planning and implementation of three community meetings, including:

- **Planning and logistics:** Develop event plan that includes overall event goals, format, approach, audience, venue identification, agenda/itinerary, equipment and supply needs, staffing and roles.
- **Notifications:** Develop suite of notification materials, including email, social media, and print (postcard, mailer, or flyer), to promote events.
- **Materials:** Develop, graphically design, and coordinate printing for event support materials such as agenda, meeting guide or other handout, comment form, display boards, and/or presentation.
- **Implementation:** Compile equipment and materials, travel to, set-up, facilitate and/or lead event, breakdown; up to three Winter staff to attend.
- **Summary and follow-up:** Develop summary including high level event information, participant numbers, photos, themes of input received; track action items.
- **Translation and interpretation:** All materials will be provided in English and Spanish at a minimum, and community meetings will be conducted in English and Spanish. Additional languages will be considered and can be included for additional cost.

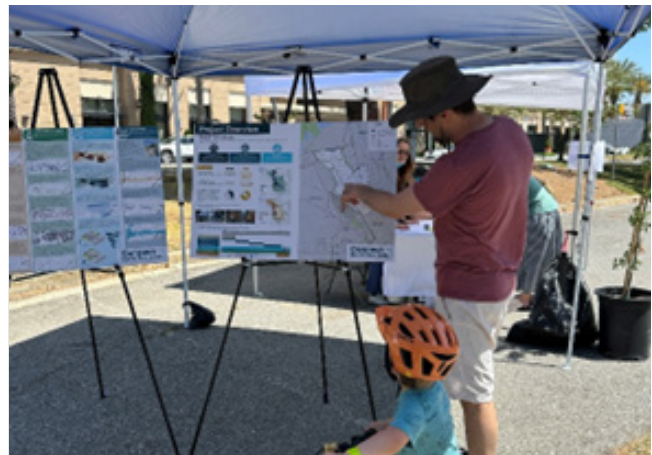
### Task 4.4 Interagency Meetings

Recognizing the importance of partnership, the Arup team will lead up to two Interagency Meetings with local agencies that might have in-depth knowledge on or be impacted by flood protection systems. These agencies would include SFO, SamTrans, OneShoreline, the City of San Bruno, and Caltrans.

The team will prepare materials for these meetings that the City will convene. We will prepare technical briefs aimed at sharing progress and identifying key questions or items that require stakeholder input and confirmation, share proposed alternatives, gather feedback on the work to-date, discuss jurisdictional concerns, and explore opportunities to coordinate on regional flood protection systems.

### Task 4 Deliverables:

- Outreach Plan
- Website with online community survey and/or online interactive feed tool
- Community mailers
- Sign-in sheets
- Community Meeting minutes summarizing discussions, attendance and action items
- Facilitation, meeting materials and summary notes for two Interagency meetings



**Arup & Winter hosted a widely attended outreach event with over 150 participants for the Connect North San Jose study. Source: Winter Consulting**

## Task 5: Advisory Committee Meetings

The Advisory Committee will play a central role as an advisory body and sounding board for the technical direction of the project. The Advisory Committee will provide input and plan review during key points of the planning process to ensure that project deliverables are based on sound planning and engineering practices that can be adopted and implemented within the City's work plans.

We understand that the Advisory Committee will be formed to include key City personnel from various stakeholder departments, such as Economic and Community Development, Public Works, and/or Parks and Recreation, and may also include representatives from partner agencies such as City of San Bruno, OneShoreline, SamTrans, Caltrain, SFO, and BCDC.

**In our experience, the most effective Advisory Committees require three elements:**

### **1. Clarity on the Committee's Roles and Responsibilities.**

As a first step, we will work with City staff to define the participatory scope, roles, and responsibilities of the Advisory Committee to best meet the objectives of the project.

### **2. Well-Organized and Actively Facilitated Meetings that Encourage Participation and Discussion.**

The schedule of Advisory Committee meetings, proposed membership, and communications protocol for contacting TAC members will be agreed upon at the project kickoff meeting. The Advisory Committee will be engaged at key milestones throughout the project duration to provide progress updates, solicit feedback, ensure recommendations are in alignment with local and regional planning and resilience efforts, build consensus amongst project stakeholders, and define clear timelines and responsibilities for project implementation.

### **3. Presentation Materials and Deliverables that are Clear, Concise, and Engaging.**

The clarity of the information provided has a direct impact on the quality of the conversations that follow. Our meeting materials will be developed with an eye towards the audience, so that Advisory Committee members with varied expertise and priorities can easily engage in the process.

The Arup Team will be responsible for preparing and leading up to four Advisory Committee meetings across the project's duration. During these meetings, we will share progress updates and actively solicit feedback ahead of the three community meetings to ensure alignment with the goals of all stakeholders, timed in preparation for public engagement. The group will review the formulation of alternatives, strategies, and designs. To make these conversations productive, we'll utilize visual materials and maps, incorporating both structured discussions and interactive activities. This gathered feedback will then be carefully synthesized and integrated into the development of the final Feasibility Study Report.

### **Task 5 Deliverables:**

- Agendas, facilitation, and PowerPoint presentations for up to four Advisory Committee meetings
- Meeting minutes summarizing discussions and action items



## Task 6: Feasibility Study Report

The work culminates in the Feasibility Study Report, which will document the technical work and present the preferred alternative design. The components of this report will include the final design package, adaptation pathways, cost-benefit assessment, and funding and implementation strategy.

### Task 6.1 Final Design Package & Project Descriptions

Arup will prepare a comprehensive alternatives package that documents the assessment of project alternatives, the evaluation process for selection of the Preferred Alternative, and the analytical results. This package will include technical details of the Preferred Alternative, including 10% concept-level design materials, such as plan-view alignments, typical cross-sections, and perspective renderings developed in Task 3. Renderings will be developed along with clear project explanations to help communicate the project's functionality and the multiple benefits it offers, including flood protection, ecological enhancement, and improved public access.

Each project component will be accompanied by a narrative describing its technical feasibility, cost-effectiveness, environmental impacts, and a synthesis of community and interagency support and concerns. This will also include an assessment of potential risks and permitting challenges. This section will also highlight how the selected alternative aligns with regional shoreline adaptation goals and BCDC's Regional Shoreline Adaptation Guidelines and Senate Bill 272.

### Task 6.2 Adaptation Pathways and Scenario Planning

To ensure long-term resilience and flexibility, Arup will develop an adaptation pathways framework which will be used to assess project alternatives and support selection of the Preferred Alternative. This approach will identify key trigger points, which represent moments when decisions must be made, and tipping points, which represent thresholds beyond which certain strategies are no longer viable due to permanent inundation or other climate-related impacts. Drawing on best practices from our work with TAM and the Honolulu Climate Adaptation Pathways project, we will use scenario planning to map out phased implementation strategies that can evolve over time in response to changing conditions.

### Task 6.3 Cost Estimates and Cost / Benefit Analysis

We will develop order-of-magnitude cost estimates for the Preferred Alternative and its component strategies. These estimates will be informed by recent comparable projects and will include capital, operations, and maintenance costs. In parallel, we will conduct a cost-benefit analysis that evaluates the expected benefits in terms of avoided losses (as identified in Task 3), as well as qualitative benefits such as improved community resilience, environmental enhancement, and recreational access. This analysis will demonstrate why the Preferred Alternative represents a feasible and strategic investment, and how it compares to other alternatives considered during the planning process.



**Bird's eye 3D rendering of the Bay Trail including proposed nature-based adaptation strategies.**

### Task 6.4 Funding & Implementation Strategy

Recognizing the evolving funding landscape, Arup will develop a realistic and actionable funding and implementation strategy which outlines next steps. This strategy will identify opportunities across federal, state, regional, and local sources, including innovative financing mechanisms such as Enhanced Infrastructure Financing Districts, PROTECT and RAISE grants, and SB 852 Climate Resilience Districts. Drawing from our work with TAM, we will align funding recommendations with project eligibility criteria and implementation timelines.

We will also define evaluation criteria to prioritize implementation actions, incorporating equity, feasibility, and co-benefit considerations. We will implement quantifiable benchmarks to monitor the project's development and assess its long-term impact. This framework will help the City make informed decisions about phasing and investment.

### Task 6.5 Draft & Final Report

The findings from Tasks 6.1 through 6.4, along with relevant technical work from earlier phases, will be compiled into a clear and concise Draft Selected Project Alternative Report. This report will provide a comprehensive overview of the planning process, including the methodology used to evaluate project alternatives, a summary of analytical results, and a synthesis of community and interagency feedback, demonstrating how it shaped the process and outcomes (Task 4).

The Arup Team will submit an administrative draft of the report to City staff for initial review. Comments will be consolidated into a single comment log, for which Arup will provide a template. Following revisions, the draft will be shared with the Advisory and Interagency Committees for additional input before being released for public review. All feedback will be documented and addressed in a comment-response matrix, which will be included in the final report to ensure transparency and accountability.

The Arup Team will carry forward all feedback into the Final Selected Project Alternative Report, documenting how we addressed comments in a comprehensive table to memorialize the final round of engagement and its influence on the Final Feasibility Study Report.

### Task 6 Deliverables:

- Draft and Final Selected Project Alternative Report, in PDF and editable Word Document formats
- All associated design files in their native and PDF formats (e.g., AutoCAD, GIS layers, etc.)



## IMPLEMENTING THE VISION: Phasing & Opportunities For Coordination With Other Partners

### North Bothin / Miller Ave Segment Partners:

- City of Mill Valley
- County DPW, & Flood Control
- SASM

### Partners for the Connection South:

- Caltrans (Shoreline Hwy/101)
- County DPW, & Flood Control (Coyote Creek)

### Evolving Shorelines Project:

- South Bothin - Phase 0
- South Bothin - Phase 1
- South Bothin - Phase 2



### TRAIL ALIGNMENT: **ALTERNATIVE 1 (Preliminary Design 2023)**



Implementation strategy elements from the Evolving Shoreline Adaptation Study for Bothin Marsh. Source: WRT





# Description of Proposer's Firm

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# 5



Arup

Founded in 1946, Arup has been a pioneer in sustainable and resilient planning and design. As a firm, we drive thought leadership in resilience and climate adaptation, collaborating with leading organizations like C40, Resilient Cities Network, the Earthshot Prize, and Resilience Rising. Through these partnerships, Arup actively shapes new best practices and promotes knowledge sharing across the industry.

Our team at Arup includes urban planners, engineers, and risk experts, and we work closely with in-house financial and policy advisors to ensure a clear path for implementation to make climate resilience a reality. Dedicated to sustainable development, the firm is a collective of 18,000 designers, advisors and experts working across 140 countries and 95 offices globally. In tandem with our domain experts, our digital technology development and communications strategists provide the skills to deliver innovative solutions to complex issues tailored to California communities.

We advise public agencies, master planners, developers, and private property owners on SLR adaptation and resilience strategies. Our resilience and planning staff has experience interfacing and coordinating with local city and county governments as well as regulatory agencies, such as BCDC, USACE, and the California Coastal Commission (CCC). We guide our clients through the SLR adaptation landscape with a collaborative, communicative approach that result in actionable outcomes and efficient use of resources.

Arup Offices

Arup staff will perform this project through our San Francisco offices, supported by our other California offices as necessary.

Firm	Primary Project Office	Supporting offices
Arup	San Francisco, CA	Oakland Sacramento Los Angeles



Proposed bridge lead, Jennifer Sudario, reviews design drawings for the Gerald Desmond Bridge in Long Beach, CA

## Team members

### WRT Design



WRT works across scales and professional disciplines to create forward-thinking, actionable solutions that meet the unique needs of the communities they serve.

WRT has been leading Bay Area coastal climate adaptation work for almost ten years. Their interdisciplinary practice of planners, urban designers, and landscape architects focuses on complex urban and natural environments to address land use, mobility, parks and open spaces, and equitable environments. These skills are instrumental to creating feasible outcomes as they tackle climate driven change. Their adaptation work spans the country from Virginia and Philadelphia to local Bay Area jurisdictions where we frequently engage agencies and funders including BCDC, State Coastal Conservancy, USACE, CDFW, DTSE, and the Water Board.

### Fehr and Peers

#### Fehr&Peers

Fehr & Peers is a multimodal transportation planning and engineering firm headquartered in the Bay Area, providing a breadth of transportation planning and engineering services to public and private clients since 1985. As a full-service multimodal transportation planning and engineering firm, Fehr & Peers offers clients insight and expertise with all matters relating to transportation, including land use and transportation planning, multimodal operations and simulation, bicycle and pedestrian planning, and much more. Their deep bench of internal expertise provides a full suite of in-house services on each project we work on. Fehr & Peers has worked extensively with the City of South San Francisco for nearly four decades and is involved in transportation projects across the Peninsula.

### Winter Consultants



Winter is a growing leader in Bay Area community outreach and stakeholder engagement striving for sustainable and empowered communities. With 12 staff combining decades of experience engaging communities in the Greater Bay Area, Winter brings a multicultural and multilingual team providing effective communication and engagement services that meets the needs of a variety of audiences. Specializing in reaching voices historically left out of the planning process, the Winter team has built a network of partnerships and community relationships around the Bay Area, including in San Mateo County through their firm and individual staff's work with SamTrans, Caltrain, San Mateo County, cities of South San Francisco, Burlingame, Pacifica, San Mateo, and Town of Colma. Winter's lead for the South San Francisco Protection and Connectivity Plan, Katie DeLeuw, is a South San Francisco resident with strong ties to the community and knowledge of community perspectives, interests, and challenges.

### San Francisco Estuary Institute



The San Francisco Estuary Institute's mission is to deliver visionary science that empowers people to revitalize nature in our communities. Their focus is on advancing science that supports rebuilding and sustaining the chemical, physical, and biological health and the resiliency of the San Francisco Bay-Delta Estuary and beyond. They are an environmental research institute and a 501c3 nonprofit organization.



## Project Experience

With decades of combined experience, the Arup team brings a deep understanding of climate resilience and transportation planning, particularly within California's complex regulatory and environmental landscape. We have successfully delivered similar services for a range of public agencies and authorities, including Caltrans, the San Francisco Bay Conservation & Development Commission (BCDC), and numerous Bay Area jurisdictions. Our work spans from regional shoreline adaptation planning to statewide climate vulnerability assessments, with a strong emphasis on multimodal transportation systems and community resilience. Notably, our experience in South San Francisco and neighboring communities positions us well to support projects that require both technical rigor and local insight. Each task outlined in the Scope of Work aligns closely with our past efforts, where we have led climate risk assessments, stakeholder engagement, and implementation planning for public agencies across the state and beyond.

The following pages demonstrate our relevant experience for this proposal.



**The team's experience integrating climate resilience and transportation planning has been demonstrated on projects throughout the region, such as our work on the Bay Trail in the East Bay visualized here.**

## Resilient Transportation Experience, Bay Area



### TAM Sea Level Rise Adaption Planning Study Marin County, CA

**Firm:** Arup, WRT

Arup and WRT led the Transportation Authority of Marin's (TAM) initiative to increase the resilience of the county's roadways, active transportation infrastructure, and transit routes. The work involved examining existing plans and studies to draw on good thinking that the county and its partners had done previously; identifying vulnerable locations and associated assets, and crafting multi-benefit adaptation measures; defining criteria for prioritizing elements of implementation; and examining governance and funding opportunities spanning a range of agencies, jurisdictions, and stakeholders. This project, which was focused on multimodal transportation assets, leveraged a GIS-based climate vulnerability and risk assessment methodology that relied on the Arup project team to collect and collate the latest sea level rise projection data to ensure that calculations and strategies are based on the best available data possible.



### Connect North San José & Guadalupe River Trail Resilience Study Project location

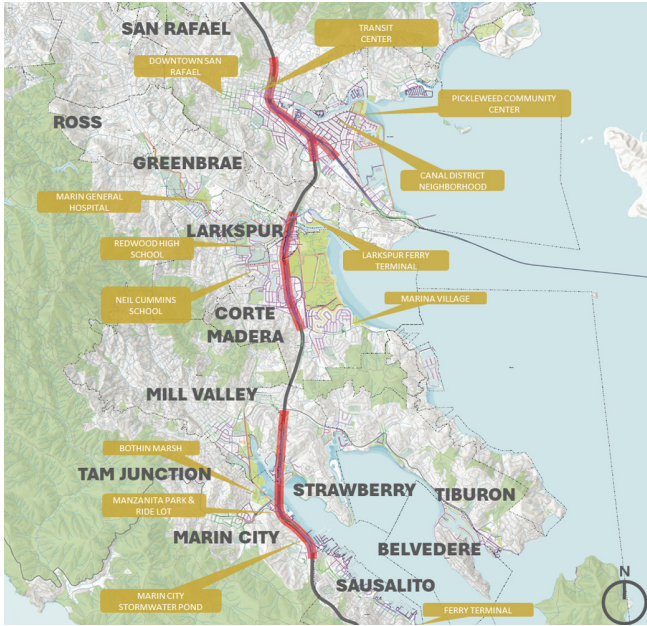
**Firm:** Arup, Winter, Fehr and Peers

Arup led a multidisciplinary team to deliver the Connect North San Jose Multimodal Transportation Improvement Plan, a comprehensive plan for sustainable transportation and climate resilience in one of the city's most economically vital areas. Through rigorous technical analysis and a robust community engagement process led by Winter Consulting, the team identified and prioritized over 400 transportation improvements to transform North San Jose from a place designed for vehicles to one designed for people. Fehr & Peers supported on identifying transit strategies to speed up light rail on North First and improve transit access across the plan area.

This work was coordinated closely with the Guadalupe River Trail Bike Connections plan, which aims to strengthen on-street bicycle and pedestrian connections to the Guadalupe River Trail. Arup led the technical analysis and flood modeling to assess trail segment vulnerability during multiple return-period flood events, identifying locations that become impassable and informing routing alternatives and design strategies that enhance resilience and year-round trail usability. By coordinating technical efforts across these two interrelated projects, Arup is helping the City of San Jose develop a future-ready North San Jose that is coordinated, complementary and ready to be actioned.



# Transportation Experience in South San Francisco



## Marin 101 Sea Level Rise Adaptation Planning Study Marin County, CA

**Firm:** Arup, WRT

Arup and WRT together are bringing unparalleled expertise and a tried-and-true partnership to the Marin 101 Sea Level Rise Adaptation Planning Study. Arup is leading the project with deep technical proficiency in coastal hazard assessment, transportation planning, and climate resilience, drawing on recent success managing these types of projects for Caltrans at the District and statewide levels. WRT is complementing this with extensive local experience in adaptation design and stakeholder-driven planning, including their leadership on the Bothin Marsh Evolving Shorelines Project and the Sausalito Sea Level Rise Adaptation Plan. Together, Arup and WRT are bridging technical rigor with inclusive, community-centered processes that will result in implementable, forward-thinking adaptation solutions. Their established working relationship and shared successes uniquely position them to guide Caltrans and Marin County stakeholders.



## South San Francisco General Plan South San Francisco, CA

**Firm:** Fehr & Peers

Fehr & Peers led the development of the transportation element of the South San Francisco General Plan and Zoning Code and the General Plan EIR. This critical work encompassed a thorough review of existing conditions, new policy language, a detailed Transportation Impact Analysis and development of a city-specific sub-area model. Fehr & Peers expertly guided the City through the implementation of SB 743 legislation, established VMT thresholds, and explored multimodal transportation alternatives. They regularly presented updates to the Citizen Advisory Committee and City Council, ensuring transparent communication and alignment with community needs. This work included focused analysis of the East of 101 area.

This impactful plan earned the Northern California APA Award of Excellence for comprehensive plan for a small jurisdiction in 2023, a testament to the collaborative efforts and forward-thinking transportation strategies developed.



### **Lindenville Specific Plan**

South San Francisco, CA

**Firm:** Fehr & Peers

Fehr & Peers led transportation planning for the Lindenville Specific Plan, the guiding document to help realize South San Francisco General Plan's vision for the area as a mixed-use neighborhood, employment hub, and cultural center. A revitalized Colma Creek represents a focal point of the plan, alongside new residential and employment hubs near the San Bruno BART Station and Linden/Spruce corridors. To support this vision, Fehr & Peers developed a transportation policy framework centered around a layered network plan that identifies modal priorities and connectivity for the local street network. Fehr & Peers prepared prototypical layouts for each street, alongside a vision for interconnected active transportation improvements, transit service, and integration with the city's TDM ordinance.



### **Oyster Point Mobility Vision Plan**

San Mateo, CA

**Firm:** Arup

Arup combined facilitation and innovative mobility scenarios to guide the Oyster Point Mobility Vision Plan, for Genentech Inc. a forward-thinking strategy for enhancing transportation connectivity to and accessibility in the Oyster Point area. Arup provided stakeholder facilitation, mobility scenario visualization, and graphic and video support, ensuring the master plan addressed infrastructure, funding, governance models, consensus building, and the review of previous planning efforts. By creating clear visual and narrative materials, Arup effectively moved the stakeholder group toward a mobility vision, aligned with Genentech's sustainability goals and the broader San Mateo community's transportation needs. This project highlights an expertise in facilitating innovative, community-focused planning processes that drive meaningful outcomes for both the private sector and the public realm.



## Bay Area Shoreline Adaptation Experience



### Sausalito Shoreline Adaptation Plan Sausalito, CA

**Firm:** Arup, WRT

The City of Sausalito's Shoreline Adaptation Plan, led by WRT and Arup, aims to address the pressing challenges posed by climate change and rising sea levels through a community-driven effort. Sausalito's unique location makes it particularly vulnerable to sea-level rise, threatening critical infrastructure, housing, transportation networks, and economic vitality. The project will assess the city's vulnerabilities and explore adaptation opportunities that preserve Sausalito's rich maritime character while protecting essential assets.

At the heart of this effort is a comprehensive update to existing vulnerability assessments complemented by extensive community engagement including pop-up events, focus group meetings, online surveys, and community workshops.

The Shoreline Adaptation Plan will provide a framework of near-, medium-, and long-term strategies to mitigate flooding, safeguard transportation and utility corridors, enhance shoreline recreation, and maintain water access for maritime industries.



### Sea Level Rise Vulnerability and Adaptation Strategy Newark, CA

**Firm:** Arup

Arup is supporting the City of Newark in its work to safeguard the city's infrastructure, ecosystems, and communities against sea level rise and local flooding. Arup developed a climate risk assessment using advanced modeling tools to simulate flood scenarios for the present day, 2050, and 2100, revealing potential inundation extents and depths. Arup has identified vulnerable community assets like infrastructure, industrial and commercial centers, residences, critical habitat, and recreation areas. By estimating financial losses and prioritizing key areas, Arup will identify critical adaptation measures and their associated costs and outline a path for implementation that is tactical and right-sized for the community's needs today and into the future.

# Bay Area Shoreline Adaptation Experience

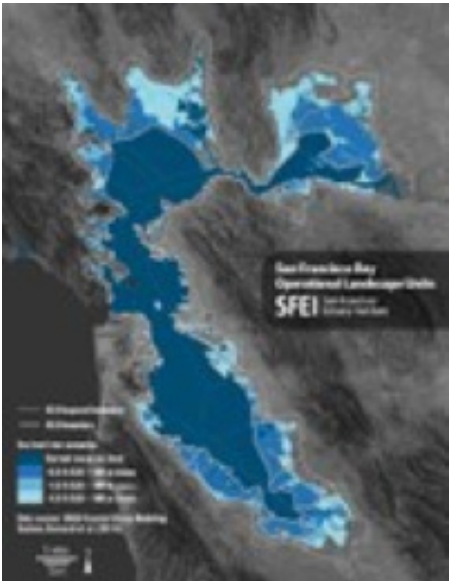


## BCDC Regional Shoreline Adaptation Plan Technical Assistance Program

Bay Area, CA

**Firm:** Arup

The San Francisco Bay Conservation & Development Commission (BCDC) recently released a set of guidelines for jurisdictions to meet requirements under SB 272, addressing the need for coordinated and standardized sea level rise adaptation along the San Francisco Bay shoreline through Subregional Shoreline Adaptation Plans.. BCDC hired Arup to develop a Technical Assistance (TA) program for jurisdictions to develop their plans in a regionally meaningful and aligned manner. Key tasks included conducting background research and engaging municipal stakeholders and coastal resilience professionals to identify priority offerings of the TA program. Arup developed a tactical work plan for BCDC to launch its TA program in 2025 and created a toolkit of resources to support the development of subregional shoreline plans that equitably address sea level rise and its impacts to communities.



## San Francisco Bay Shoreline Adaptation Atlas

San Francisco Bay Area, CA

**Firm:** San Francisco Estuary Institute

SFEI created the San Francisco Bay Shoreline Adaptation Atlas in collaboration with SPUR, with funding from the San Francisco Bay Regional Water Quality Control Board and others. The Adaptation Atlas is a science-based framework for developing climate adaptation strategies that are right-sized for the diverse shoreline settings and account for the natural processes in the Bay. The report proposes nature-based solutions that provide multi-benefits, organized into 30 Operational Landscape Units (OLUs) for San Francisco Bay. The Adaptation Atlas has become a foundational tool for understanding shoreline conditions and adaptation options in San Francisco Bay.

Image: Operational Landscape Units from the San Francisco Bay Shoreline Adaptation Atlas (SFEI and SPUR 2019)





### **San Francisco Bay Trail Risk Assessment and Adaptation Prioritization Project**

Contra Costa and Alameda Counties, CA

**Firm:** WRT, Arup

Arup and WRT partnered to support the East Bay Regional Park District understand sea level rise and coastal flooding risks along the Bay Trail, prioritize the most vulnerable segments, and develop adaptation solutions for those segments. Arup led a flood risk assessment for over 30 segments of the San Francisco Bay shoreline spanning a 50-mile area crossing two counties and abutting several major state highways. This assessment considered physical and operational impacts to Bay Trail segments and surrounding infrastructure, communities, marshes, and wetlands. Arup's hazard and vulnerability analysis included quantifying how susceptible various segments are to inundation and coastal cliff erosion when subjected to sea level rise, tidal flooding, and storm flooding, including storm surge and waves. Arup incorporated equity into the prioritization considerations for segments by mapping MTC's Equity Priority Communities and identifying where adaptation solutions could support protection of frontline communities.

Other relevant resilient transportation work



**Caltrain Climate Change Vulnerability Study**  
San Francisco, CA

**Firm:** Arup

Caltrain’s rail service is grappling with significant, year-round climate impacts which Arup aims to help the agency address through a Climate Change Vulnerability and Risk Assessment Study. Arup is creating opportunities for community and stakeholder feedback by engaging representatives of disadvantaged communities, community-based organizations, local agencies, labor, and other to understand the community’s concerns related to climate vulnerabilities. Arup is combining this qualitative feedback with a quantitative climate vulnerability analysis that will equip Caltrain with the data it needs to integrate adaptation strategies to improve the system’s long-term resilience into the capital improvement program and business operations.



**Hawaii Climate Adaptation Work**  
Honolulu, HI

**Firm:** Arup

Arup developed climate resilience guidance for a private development in transit-oriented development (TOD) areas on behalf of the City and County of Honolulu Planning Department and the State of Hawaii. Our work prioritized hazard mitigation, stormwater and sea level rise management, and heat adaptation. We tailored scalable phased solutions to a range of building types—including point towers, mid-rise residential, multi-tenant retail, and low-rise townhomes—ensuring alignment with evolving TOD plans.

Arup led the sea level rise adaptation strategy for the City and County of Honolulu’s \$80M Kapālama Canal Resiliency Master Plan. This included feasibility studies and technical design alternatives, —such as floodwalls, berms, dredging, and bridge stabilization, —designed to meet mid- and end-of-century sea level rise benchmarks. By integrating nature-based solutions with engineering best practices, we helped reduce flood risk while enhancing public space and long-term livability.

Together, these efforts reflect Arup’s commitment to delivering forward-looking, flexible climate strategies that protect communities and enable sustainable urban growth in Hawaii.





### Caltrans Climate Change and Vulnerability Risk Assessment Statewide Report

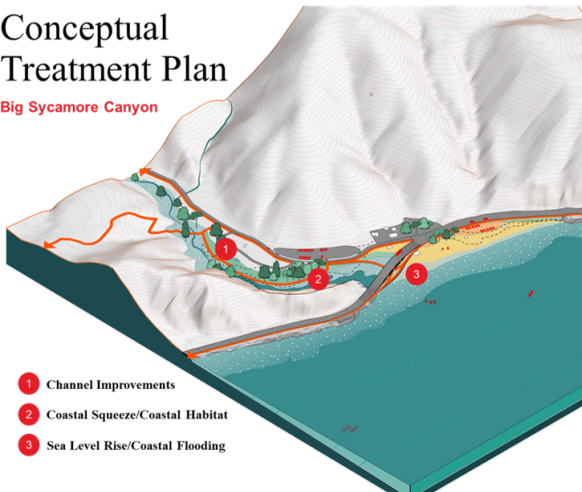
CA

**Firm:** Arup

Arup is currently leading a team of over 25 staff, including major expert subcontractors, coordinating with stakeholders across all Caltrans districts to advance the Caltrans Statewide Risk Assessment. The risk assessment aims to help the agency understand which assets are at the highest risk around the state and outlines a path forward for the agency to address these vulnerabilities. Aside from the technical risk assessment work, this project involves coordinating stakeholder agencies, obtaining input and buy-in through community outreach, and delivering the assessment. Through disciplined project management, we are maintaining active communications with the Caltrans client team and routinely syncing on scope, budget, and schedule.

### Conceptual Treatment Plan

Big Sycamore Canyon



### Caltrans Climate Change Adaptation for Pacific Coast Highway Bicycle and Pedestrian Infrastructure (District 7)

Ventura County, CA

**Firm:** Arup

This project focused on a seven-mile corridor on Highway 1 in Ventura County that has repeatedly experienced erosion, flooding, and landslide issues, which are expected to worsen with sea level rise. Arup's project management staff worked closely with Caltrans D7 staff to complete this project on time and on budget, hitting key milestones and maintaining effective and frequent communications. As a first-of-its-kind study for the agency, this project provided a blueprint for Caltrans that they using to advance similar work across other coastal Caltrans districts to develop long-term coastal adaptation strategies for coastal highways. The dual-purpose nature (resilience and safety) of this project will provide multiple benefits to the community by improving active transportation options and sea level rise adaptation solutions,



# Proposer's Staff Team

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# 6



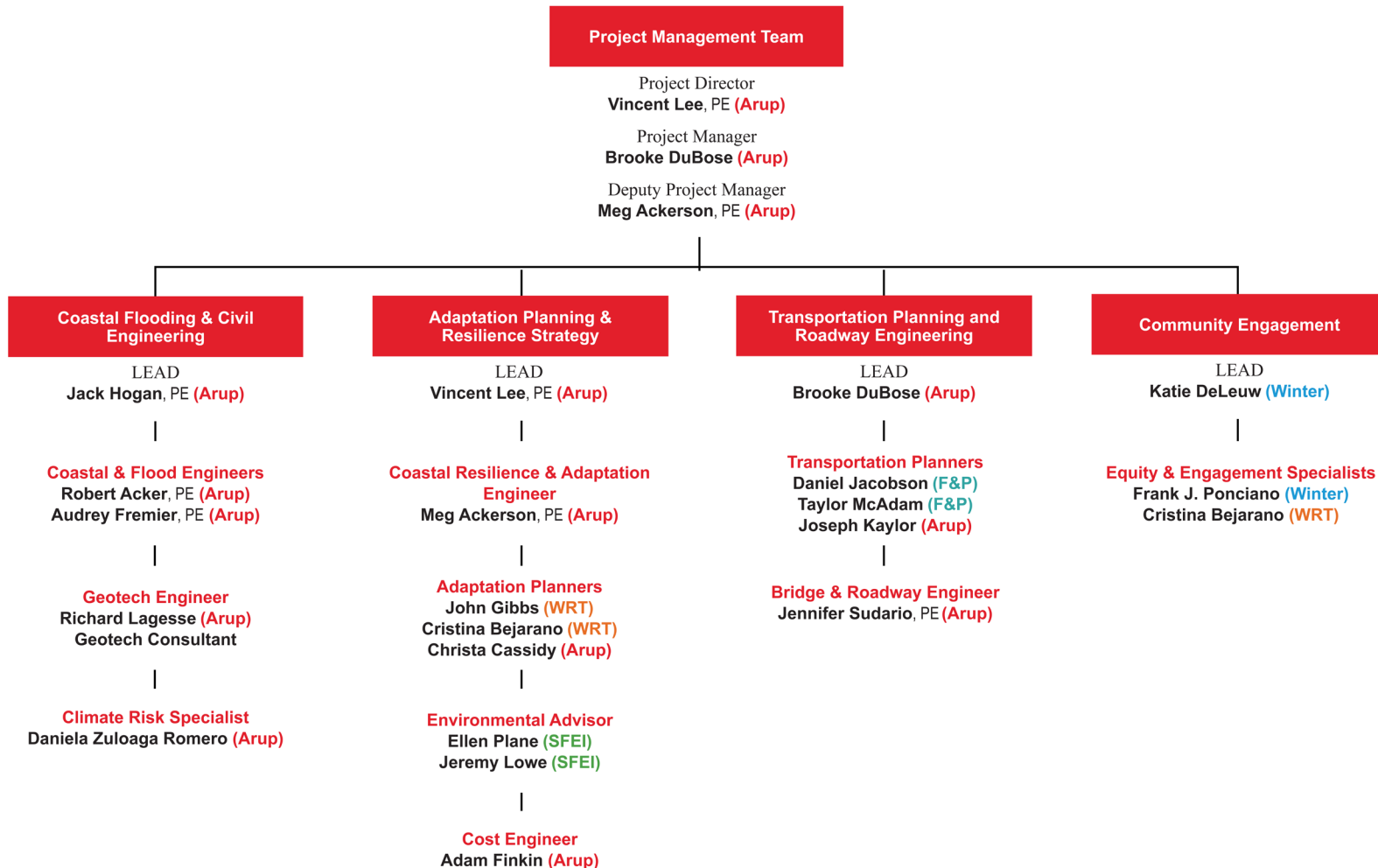
## Team Organization Chart

Arup knows, quite simply, that projects are delivered by people. From our key management team down through our task leads and subject matter experts, we have carefully crafted our team to include individuals with the right skills and experience to deliver this important project to the City of South San Francisco.



### City of South San Francisco

Public Works Department, Engineering Division



### Lead Consultant

Brooke DuBose is Arup's primary contact in providing services for this project and is the Key Person in an agreement with the City of South San Francisco. Brooke is an Associate Principal and is the Regional Climate Leader for Roads and Streets. She brings 20+ years of experience with multimodal transportation policy, planning, and engineering projects throughout California.

## Project management team



**Vincent Lee, PE, LEED AP, ENV SP, Arup: Project Director, Adaptation Planning & Resilience Lead**  
**Time on project: 15%**

Vincent is a Principal in Arup with over 25 years of experience in sustainable site development, green infrastructure and integrated water management. Vincent has applied his civil engineering expertise to several resilience projects from policy to construction across varying typologies of the built environment. He is an expert in resilient design with experience in assessing the hazards posed by climate change and translating the impacts into resilience and adaptation strategies to mitigate the risk. He is actively leading waterfront resilience projects in New York, New Jersey, Boston, Cleveland, Providence, Miami Beach and Vancouver.



**Brooke DuBose, Arup: Project Manager, Transportation Lead**  
**Time on project: 25%**

Brooke leads Arup's roadways and climate resilience practice in the Americas. She brings 20+ years of experience in sustainable transportation policy, planning, and engineering projects. She has led multiple statewide initiatives in California, including Caltrans' Active Transportation Plans, their Climate Risk and Vulnerability Assessment, and site design for CA High Speed Rail Stations. Brooke oversees complex teaming and client relationships across departments, agencies, and public/private partnerships to develop and deliver innovative projects. She has dedicated her career to serving communities through the lens of equity and inclusion. Prior to joining Arup, Brooke worked at prominent transportation firms Toole Design (2016–2022) and Fehr & Peers (2008–2016).



**Meg Ackerson, PE, Arup: Deputy Project Manager, Coastal Resilience & Adaptation Engineer**  
**Time on project: 30%**

Meg specializes in climate risk and engineering to analyze the impact of natural hazards on our built environment and develop adaptation solutions for a resilient future. Her skills in civil engineering, risk analysis, climate science, and GIS modeling support the team's Resilience and Adaptation business. Meg's educational background in structural engineering formed a strong foundation for her to analyze building and infrastructure responses to a variety of natural hazards, from sea level rise to wildfires. She conducts probabilistic risk assessments to determine the consequences of such disasters and develops holistic adaptation solutions to improve community resilience.



## Coastal Flooding and Civil Engineering



**Jack Hogan, PE, Arup: Coastal Flooding & Civil Engineering Lead**

**Time on project: 25%**

Jack specializes in combining climate adaptation strategies with practical civil engineering and infrastructure planning expertise with a focus on coastal cities and communities. Jack's work focuses on analyzing and developing engineering and planning solutions that mitigate impacts from flooding, sea level rise, erosion and other climate hazards. Throughout his 13 years of experience, Jack has managed projects of multi-disciplinary teams through assessment, planning, and design efforts for cities, counties, urban districts, rail system, dams, levees, seawalls, highways, bridges, and trails with a focus in California.



**Robert Acker, PE, Arup: Coastal & Flood Engineer**

**Time on project: 30%**

Robert has 15 years of experience in coastal engineering and numerical modeling. Past coastal engineering work includes the application of state-of-the-art wave, hydrodynamic, and sediment transport models; experience with the techniques and equipment used to collect data in the coastal environment, including tides, currents, bathymetry, and waves; and design experience with flood protection systems, shoreline erosion treatments, piers, boardwalks, and bridges. He has also reviewed and advised several port authorities on resiliency upgrades and natural disaster mitigation utilizing both passive and active protective designs.



**Audrey Fremier, PE, Arup: Coastal & Flood Engineer**

**Time on project: 30%**

Audrey delivers integrated water solutions through technical leadership in hydraulic modeling, climate resilience planning, and interdisciplinary project coordination. She has experience with complex assignments involving stormwater systems, fire water networks, and flood risk assessments. Audrey brings deep expertise in hydrologic and hydraulic modeling tools such as EPA SWMM, InfoWater Pro, and HEC-RAS, and applies these skills to support resilient infrastructure design and regulatory compliance. Her work spans urban and rural contexts, with a focus on integrating climate risk, sustainability, and nature-based solutions into water system planning and design.



**Richard Lagesse, Arup: Geotechnics Engineer**

**Time on project: 30%**

Richard is a Senior Engineer with 12 years' experience in geotechnical engineering, engineering geology, and natural hazard risk and resilience. He has diverse global experience in established and emerging markets and has been engaged on a wide range of infrastructure, buildings and consulting projects. Core technical experience includes ground characterization, natural hazard and risk assessment and geotechnical advisory to planning projects. Richard's skill set is complimented by extensive international field experience on site investigations, field mapping assignments and post-disaster missions.



**Daniela Zuloaga Romero, Arup: Climate Risk Specialist**

**Time on project: 30%**

Daniela is an Associate at Arup and has more than a decade of experience as a disaster risk specialist conducting multi-hazard qualitative and quantitative assessments and in developing disaster and climate change risk mitigation and resilience strategies. Before joining Arup, Daniela worked in the Inter-American Development Bank (IDB) where she worked incorporating disaster and climate change risk considerations in projects.

## Adaptation Planning and Resilience Strategy



**Vincent Lee, PE, LEED AP, ENV SP, Arup:** Project Director, Adaptation Planning & Resilience Lead

**Time on project:** 15%

See bio on page 47.



**Meg Ackerson, PE, Arup:** Deputy Project Manager, Coastal Resilience & Adaptation Engineer

**Time on project:** 30%

See bio on page 47.



**John Gibbs, WRT Design:** Adaptation Planner

**Time on project:** 20%

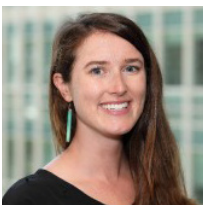
John is a practice leader in WRT's Parks & Open Space and Community Design practices, where he advances community and ecological resiliency in all WRT projects. Community engagement is fundamental to all facets of his work and his outreach skills are valued by clients who seek positive outcomes rooted in productive public dialogue. John's recent work builds on WRT's core practice areas and mission to address climate resiliency and social equity. He is leading coastal adaptation work to prepare communities for sea level rise through productive community dialogue and place-based adaptation responses.



**Cristina Bejarano, WRT Design:** Adaptation Planner, Community Engagement

**Time on project:** 20%

Cristina Bejarano leads WRT's resilience and adaptation planning practice. She is a certified planner with 18 years of cumulative experience in landscape architecture, architecture, urban design, and environmental planning. She has worked at a wide-range of scales from environmental and campus master planning, to place-making and architectural design. Each project contributes to the overarching goal of promoting sustainable development through the design of active neighborhoods and vibrant ecological systems rooted in social equity and climate resiliency.



**Christa Cassidy, Arup:** Climate Resilience Planning and Mitigation Banking Specialist

**Firm:** Arup

**Time on project:** 20%

Christa Cassidy is an experienced urban planner and project manager with over a decade of expertise at the intersection of climate resilience, equity, and land use policy. She leads efforts to integrate climate adaptation and mitigation banking into regional and local planning initiatives. Christa plays a critical role in climate resilience initiatives, such as the San Francisco Bay Conservation & Development Commission's Regional Adaptation Strategy and sea-level rise adaptation planning for the City of Newark and Marin County. Her expertise in stakeholder engagement, policy development, and multi-benefit strategies makes her a leader in advancing sustainable and equitable climate solutions.



**Ellen Plane, San Francisco Estuary Institute:** Environmental Advisor

**Time on project:** 5%

Ellen Plane is an environmental scientist with expertise in sea level rise adaptation planning, nature-based solutions, and baylands ecology. She has extensive experience translating complex technical information into accessible guidance and decision-support tools. Ellen will manage the project for SFEI and serve as a technical adviser, providing input on habitats, species, ecological resources, and inclusion of relevant environmental datasets, as well as guidance on development of nature-based solutions.





**Jeremy Lowe, San Francisco Estuary Institute: Environmental Advisor**

**Time on project: 5%**

Jeremy Lowe is a coastal geomorphologist with over 30 years of experience in tidal wetland restoration and sea level rise adaptation planning. He specializes in coastal geomorphology, nature-based solutions, and sediment dynamics. Jeremy will serve as a technical adviser, providing input on the integration of nature-based solutions and alignment of the project with regional habitat goals and adaptation planning efforts. His role includes reviewing key deliverables and participating in technical discussions.



**Adam Finkin, Arup: Cost Engineer**

**Time on project: 15%**

Adam Finkin is a Cost Engineering Analyst leading the Arup Americas Risk Management offering. Adam has experience in construction management, cost estimating, cost planning, cash flow projections, scheduling, value engineering, risk management, risk analysis, and life cycle cost analysis. Several notable projects include the CA High Speed Rail, Transbay Terminal, Long Baseline Neutrino Facility Tunnel Excavations, and the Presidio Parkway. He has experience in business administration, finance, financial modeling, and is project manager for an Arup DTF research project studying the integration of BIM and cost analysis, as well as an effort in collaboration with UC Berkeley and U Washington studying project delivery methods and transaction costs.

## Transportation Planning and Roadway Engineering



**Brooke DuBose, Arup:** Project Manager, Transportation Lead

**Time on project:** 25%

See bio on page 47.



**Daniel Jacobson, Fehr and Peers:** Transportation Planner

**Time on project:** 20%

Daniel Jacobson is a Principal at Fehr & Peers focusing on transportation strategy, policy, operations, and design projects. Daniel focuses on complex transit, complete streets, and development projects, drawing upon a range of experiences helping public and private sector clients. He excels at helping clients resolve challenges at all stages of project development. Daniel brings a passionate, problem-solving approach to transportation projects to achieve meaningful, implementable outcomes.



**Taylor McAdam, AICP, Fehr and Peers:** Bridge & Roadway Engineer

**Time on project:** 20%

Taylor is an Associate at Fehr & Peers who is passionate about co-creating resilient, safe, equitable, and community-beloved public streets and transportation experiences. She specializes in managing transportation plans that link together multiple disciplines and a multitude of different community and agency partners. Anticipating the linkages of distinct analytical tasks and assembling a coherent story is a particular skill that sets her up to lead robust, community-engaged plans.



**Joe Kaylor, Arup:** Transportation Planner

**Time on project:** 30%

Joe's passion for sustainable transportation policy, combined with his applied skills in traffic modeling and big data analytics, yields value and quality in his project work. As an experienced traffic modeler, data analyst, and GIS specialist, Joe pairs his technical skills with robust policy analysis, utilizing his background in environmental policy and experience as a research fellow for the National Center for Sustainable Transportation. Joe leverages a data-driven approach that ensures comprehensive solutions for complex and multi-stakeholder projects.



**Jennifer Sudario, PE, Arup:** Bridge & Roadway Engineer

**Time on project:** 15%

Jennifer leverages her design-build engineering experience and passion for integrated design in managing multidisciplinary infrastructure projects. Her expertise is in civil structures, soil-structure interaction and seismic design including reinforced concrete tunnel portal structures, cut-and-cover tunnels, complex retaining walls, sound walls, and other buried structures. Additionally, Jennifer has design experience for pedestrian and roadway bridges, high-speed rail viaduct structures as well as load rating and asset management.



## Community Engagement



**Katie DeLeuw, Winter Consultants:** Community Engagement Lead

**Time on project:** 35%

As a resident of South San Francisco, Katie understands many of the community's concerns and needs, as well as the potential challenges of engaging on this topic, and can leverage her local relationships to support engagement and awareness-building in South San Francisco. Specializing in communication and community engagement for transportation, environmental, and community planning projects, Katie is a collaborative leader and community engagement strategist with 20 years of experience managing and implementing stakeholder and public participation plans.



**Frank Ponciano, Winter Consultants:** Community Engagement

**Time on project:** 20%

Frank brings his passion about equity in public participation to his work at Winter, where he contributes with his extensive community engagement experience and wide network of Bay Area relationships. Frank has significant experience strategizing, implementing, and facilitating a variety of engagement events, including open houses, focus groups, community workshops, and stakeholder interviews. As a native Spanish speaker, Frank excels in facilitating monolingual Spanish events in addition to English, as well as managing the logistics of meeting facilitation that involves multiple languages being offered through interpretation services.



**Cristina Bejarano, WRT Design:** Adaptation Planners, Community Engagement

**Time on project:** 20%

See bio on page 50.

## Resumes

Please find attached professional biographies/resumes for key professionals and subconsultants who will be assigned to provide services in your proposal.





## Vincent Lee, PE

Vincent has collaborated closely with his clients to find creative and context-sensitive solutions while still achieving high performance objectives of the project.

Vincent Lee, PE, LEED AP, ENV SP is a Principal in Arup with over 25 years experience in sustainable site development, green infrastructure and integrated water management. He is an expert in resilient design with experience in assessing the hazards posed by climate change and translating the impacts into resilience and adaptation strategies to mitigate the risk. His resilience involvement in the NY metropolitan area includes the NYS2100 Commission, NYCDOT and MTA NYCT post-Sandy resilience work, HUD Rebuild by Design (Jersey Shore), the NY Rising Community Reconstruction Program (Long Island) and NYCHA Red Hook Houses. Furthermore, he is actively leading waterfront resilience planning and implementation in New Jersey, Boston, Cleveland, Providence, Miami Beach and Vancouver.

### Profession

Civil Engineering

### Current position

Principal

### Joined Arup

2006

### Years of experience

26

### Qualifications

Adjunct Professor on Resilience and Sustainability, Cooper Union, 2024-current

MS, Civil Engineering, New Jersey Institute of Technology, 2002

BS, Civil Engineering with minor in Environmental Engineering, Pennsylvania State University, 1998

PE, State of Massachusetts (57580), Michigan (6201313293), New Jersey (24GE04527200), New York (087876), Ohio (87914), Texas (140508), Illinois, Rhode Island

LEED Accredited Professional, 2006

ISI ENV SP, 2013

### Project experience

#### False Creek South Conceptual Development Plan, Vancouver, BC

Arup, as lead consultant, is providing the City of Vancouver multidisciplinary support to develop a comprehensive plan for the development of False Creek South, a 55-hectare waterfront community first developed in the 1970s on former industrial land. Vancouver City Council has set an ambitious vision for False Creek South, aiming to redefine how urban land is used to promote social diversity, climate resilience, and innovative housing solution. Vincent is part of the Arup management team and leading the technical studies on (including flood risk, geotechnical, environmental, water, wastewater, energy) that will influence the shape of the future development plan.

#### Hunter's Point South, Long Island City, NY

Engineer-of-Record for the infrastructure of Hunters Point South where Arup was prime consultant for the New York City Economic Development Corporation. He was also involved at the conceptual stage of the project and participated in workshops and stakeholder engagement to determine the applicable sustainable strategies for the development. The award-winning project involved the construction of infrastructure for a new mixed-use development on reclaim a former industrial area. Key to the development is the integration of green infrastructure for stormwater management throughout the park, and a pilot project in the city streets within the public right-of-way.

#### Cleveland Harbor Eastern Embayment Resilience Strategy (CHEERS), OH

Project Director for the advancement and design of CHEERS, 80-acres of new parkland in Cleveland. The park's development involves innovative utilization of US Army Corps dredge for creating aquatic and terrestrial habitat, safeguarding highway infrastructure, enhancing multi-modal connections, and transforming the lakeshore into a vibrant community asset. Arup are the prime consultant contracted with Port of Cleveland who are working closely with

Cleveland Metroparks. Vincent is the Engineer-of-Record and is responsible for technical excellence, quality, team partnerships and resourcing.

#### Wharf District Council Resiliency Plan, Boston, MA

Project Director for the Wharf District Council's flood resiliency concept plan for Boston's Wharf District. Through a series of due diligence assessments, stakeholder engagement workshops, and engineering design, we built upon Boston's prior resiliency plans to produce a flood protection strategy that incorporates a comprehensive set of district-wide goals that has secured the endorsement of each waterfront property owner. The concept design includes coastal and inland flood resiliency systems, stormwater and groundwater management systems, and nature-based solutions.

#### NYCDEP Right-Of-Way Green Infrastructure – Coney Island CSO Tributary Area, Queens, NY

As prime consultant to the NYCEDC, Arup is contracted to retrofit the public R.O.W. with a target of 628 green infrastructure practices (bioswales, stormwater green streets, permeable pavement, etc.) within 628 acres of the Coney Island CSO watershed in Brooklyn, NY. To meet the objectives of the NYC Green Infrastructure Plan and requirements of the Long-Term Control Plan, the project involves multi-agency collaboration and maximizing opportunities for green infrastructure implementation within city streets. Vincent is the project director leading the civil engineering work on tributary analysis, site selection process, mobile data collection, GIS data management, detailed engineering design and construction administration.

#### Providence Riverwalk Resilience, Providence, RI

Project Director for this vital initiative to enhance and protect the Riverwalk in Downtown Providence. Originally constructed in the 1980s, the Riverwalk was developed to reclaim the riverfront, transforming it into a vibrant public space. However, new challenges such as more frequent and severe flooding due to sea-level rise, ADA compliance issues, public safety concerns, and environmental degradation have emerged, necessitating a comprehensive resilience strategy. The City of Providence was awarded \$7.8 million in Rebuilding American Infrastructure with Sustainability and Equity (RAISE) planning funds from the US Department of Transportation (USDOT) to advance the Riverwalk Resilience Project. Arup, having previously worked on the "Unified Vision for Downtown Public Spaces" masterplan, will now take the project from 30% design to final engineering, continuing our commitment to innovative and sustainable urban development. As Project Director, Vincent is responsible for providing strategic leadership and overseeing delivery of the work which includes: addressing flooding and climate resilience, enhancing ADA accessibility, improving public safety, enhancing water quality and habitat for native species, improving bicycle accessibility, and strengthening connections between key public spaces and transportation hubs.

#### Miami Beach Historic Districts Resiliency Guidelines, Miami Beach, FL

Vincent is the Project Director for the Arup team collaborating with Shulman + Associates Beach to provide Architectural and Engineering Services for Historic District Resiliency and Adaptation Guidelines for the Flamingo Park and Collins Waterfront Historic Districts for the City of Miami which is vulnerable to ongoing and increasing tidal flooding, and the long-term impacts of sea level rise. Our team helped to guide the City of Miami Beach through the decision-making process to develop a set of guidelines and regulations for area property owners, designers, and contractors based on climate projections from the Southeast Florida Regional Climate Compact. Arup provided technical consultancy on stormwater management, adaptation strategies for the buildings and cost estimates for various options for renovation and adaption, ranging from short term immediate solutions to more robust long-term adaptation strategies.

#### NJDEP Liberty State Park South Master Plan, Jersey City, NJ

Vincent is the Principal-In-Charge and Engineer-of-Record for the Liberty State Park revitalization program. Arup is developing vision plans for development, conservation, and recreational use of the historic Liberty State Park (LSP). The plans will include open space and park planning for a unified vision for the 400 Acres of parkland. The primary objective of plan is to integrate landscape performance and planning centered around resiliency and restoration to address park vulnerabilities to climate change.





## Brooke DuBose

Brooke brings 20 years of experience in multimodal transportation policy, planning, and engineering projects throughout California. Her expertise includes regional planning studies and Complete Streets roadway design, with an emphasis on climate resilience, social equity frameworks, and project implementation strategies.

### Profession

Transportation Planning & Design

### Current position

Associate Principal,  
Cities, Planning & Design Leader

### Joined Arup

2022

### Years of experience

20

### Qualifications

MS, Urban and Regional Planning,  
Hunter College, City University of  
New York, 2006

BA, Sociology, Vassar College,  
New York, 1998

Well-versed in the technical issues, politics, and economics of bringing solutions to diverse communities and environments, Brooke's objective for all clients is to work with them to define their goals, provide them with top-level advice, and strategically position their projects for success. Brooke oversees complex teaming and client relationships across departments, agencies, and public/private partnerships to develop and deliver innovative projects. She has dedicated her career to serving communities through the lens of equity and inclusion.

### Project experience

#### TAM Sea Level Rise Adaptation Planning for the Countywide Transportation System, Marin County, CA

Brooke is serving as the Project Director on this comprehensive sea level rise adaptation planning project for Marin County. The project involves examining existing plans and documents, identifying vulnerable locations and assets, identifying adaptation measures, defining criteria for prioritizing elements of implementation, and examining governance and funding spanning a range of agencies, jurisdictions, and stakeholders. Brooke's advisory role is focused on multi-modal transportation infrastructure, including coordination with the Caltrans District 4 office.

#### Connect North San Jose: Multimodal Transportation Improvement Plan, CA

Brooke is serving as the Project Director for Connect North San Jose, an initiative to identify sustainable transportation and climate resilience projects, policies, and programs to support this priority growth area. North San Jose is the second largest concentration of employment in the city and an anchor for Silicon Valley jobs, hosting tech campuses included Samsung, Paypal, and Cisco. Brooke is providing oversight of a multidisciplinary technical team to deliver spatial analysis on existing conditions, and detailed recommendations for policies, programs and detailed design projects. She coordinated an extensive outreach effort, including events in Spanish- and Vietnamese-speaking communities and working with local nonprofit groups to foster an inclusive planning process.

#### City of Newark, Sea Level Rise Vulnerability Assessment and Adaptation Strategy, CA

Arup is supporting the City of Newark in assessing their vulnerability to sea level rise and developing an adaptation strategy to protect its shoreline along

the San Francisco Bay. Arup is working with local stakeholders to identify critical community infrastructure and co-create possible adaptation strategies that achieve long-term climate resilience while achieving other critical benefits for residents. As part of this work, the team is developing an implementation plan for the City to get projects established with the intention of providing multiple benefits for residents. Brooke is the Project Director.

#### Fresno County Climate & Transportation Resiliency Plan, CA

Brooke is the Project Director for the Climate Resiliency Plan for the transportation assets in Fresno County. The purpose of the Climate Resilience Plan is to identify specific transportation improvement projects that address vulnerable transportation assets to become candidate projects for the 2026 Regional Transportation Plan/Sustainable Community Strategy. The study involves using the latest climate data to undertake a risk assessment of the County's transportation assets for flood, heat, wildfire, and landslide, development and prioritization of potential projects to reduce risk, prioritization based on stakeholder and community priorities, and a deep dive risk assessment of the top five projects.

#### Caltrans Statewide Climate Vulnerability and Risk Assessment, CA

Brooke is the Project Director for the update to the Caltrans' Statewide Climate Change Vulnerability Assessments. This project is focused on an assessment of climate risk for the State's multimodal transportation system, including all rail and transit. It is guided by robust engagement and partnership across all twelve Caltrans Districts and Headquarters Divisions to ensure that the methodologies and final work products reflect both local and statewide priorities. She is well-versed in the technical issues, politics, and processes across Caltrans, and understands how to craft solutions that position the agency for success.

#### Caltrans District Level Active Transportation Plan, CA\*

Brooke served as the Project Manager for this project, which created active transportation plans for all 12 Caltrans districts throughout California. The project identified State Highway System segments to include in an asset inventory of bicycle and pedestrian facility needs and developed a standardized methodology and format for collecting and storing asset data. A statewide data framework and methodology informed each District Plan and provided a flexible approach for each district to customize their study process to meet local context and needs. Brooke played a leadership role in all aspects of the project, including developing and implementing a route prioritization (demand and needs) methodology and is identifying gaps in the network, performance metrics, and prioritization criteria. Throughout the study process and as a part of each plan, there was an emphasis on social equity—strengthening and reconnecting communities, and improving safety and access for people who walk, bicycle, and use transit.

#### Oakland-Alameda Access Project, Alameda County, CA\*

Brooke was the Lead Active Transportation Planner on this project that will reconstruct the I-880 freeway interchange and the local street network around the Posey Tube connection between Oakland and Alameda, California. Brooke served as an advisor in support of the design of planned bicycle and pedestrian infrastructure improvements throughout the project limits. The project plans to install protected bike lanes and shared use paths in a highly urbanized neighborhood that currently has very little existing active transportation infrastructure.

#### Port of Oakland Bicycle and Pedestrian Design Services, Oakland, CA\*

Brooke was the Principal-in-Charge and lead planner for this design project in the Port of Oakland. Numerous bicyclists and pedestrians traverse the Port area when connecting between the Bay Bridge Trail and the City of Oakland or traveling to Middle Harbor Shoreline Park. Brooke worked with the Port to develop concept designs for solutions to safely accommodate vulnerable road users in an area that sees an exceptional level of truck traffic. She developed shared use path and intersection designs for safe and comfortable shared use path facilities in the Port for both near-term road conditions and a future reconfiguration that will realign roadways and several railroads in the Port.

\*Experience prior to joining Arup



## Meg Ackerson, PE

Meg utilizes her background in climate risk and engineering to analyze the impact of natural hazards on our built environment and develop adaptation solutions for a resilient future.

Meg works as a Senior Engineer with Arup's Risk and Resilience team, located in San Francisco. Her skills in civil engineering, risk analysis, climate science, and GIS modeling support the team's Resilience and Adaptation business. Meg's educational background in structural engineering formed a strong foundation for her to analyze building and infrastructure responses to a variety of natural hazards, from sea level rise to wildfires. She conducts probabilistic risk assessments to determine the consequences of such disasters and develops holistic adaptation solutions to improve community resilience.

### Profession

Risk and Resilience

### Current position

Senior Engineer

### Joined Arup

2019

### Years of experience

6

### Qualifications

PE State of California (C96693)

MS Structural Engineering,  
Stanford University, 2019

BS Civil Engineering, Santa Clara  
University, 2017

### Professional associations

Earthquake Engineering Research  
Institute (EERI)

Structural Engineers Association of  
Northern California (SEAONC)

### Committees

Past Chair of Resilience  
Committee, SEAONC

### Awards

Stanford University Civil and  
Environmental Engineering  
Department Fellowship

### Project experience

#### Coastal Resilience Planning Support for Caltrans HQ, CA

Meg is a Civil Engineer for a multi-faceted project with Caltrans Headquarters supporting their coastal resilience program. This effort involves developing new research, analysis, and policy guidance aimed at embedding best practices in Caltrans's coastal projects and programs. Arup is assisting in updating the Standard Environmental Reference (SER) materials in alignment with the Caltrans Sea Level Rise (SLR) Guidance and District 4's SLR3D effort. Arup is assisting Department of Environmental Analysis (DEA) in updating the Caltrans SLR Guidance document, which is necessary for addressing SLR risks in transportation projects. Arup is working with DEA to provide support to asset management in delivery of the SLR Adaptation Performance Objectives within the State Highway Operation and Protection Program.

#### Sea Level Rise Adaptation Planning for Marin County's Transportation System, CA

Meg is the Resilience Engineer and Deputy Project Manager for the Transportation Authority of Marin's sea level rise adaptation planning project. This comprehensive sea level rise adaptation planning project involves examining existing plans and documents, identifying vulnerable locations and assets, developing adaptation measures with emphasis on nature-based solutions, creating a multi-phased implementation plan, and evaluating governance and funding spanning a range of agencies, jurisdictions, and stakeholders. This project, which is focused on multi-modal transportation infrastructure, leverages a GIS-based climate vulnerability and risk assessment methodology that relies on the Arup project team to collect and collate the latest sea level rise projection data.

#### Sea Level Rise Vulnerability and Adaptation Strategy, Newark CA

Arup is supporting the City of Newark in its work to safeguard the city's infrastructure, ecosystems, and communities against sea level rise and local flooding. Arup developed a climate risk assessment using advanced modeling tools to simulate flood scenarios for the present day, 2050, and 2100, revealing



potential inundation extents and depths. Arup has identified vulnerable community assets like infrastructure, businesses, and open space recreation areas. By estimating financial losses and prioritizing key areas, Arup will identify critical adaptation measures and their associated costs and outline a path for implementation that is tactical and right sized for the community's needs today and into the future. Meg is the Deputy Project Manager and Technical Lead for this project.

#### Caltrans Statewide Climate Vulnerability and Risk Assessment, CA

Meg is a Climate Risk and Resilience Engineer for the statewide climate vulnerability and risk assessment for Caltrans. This project analyzes the vulnerability of 50,000 lane miles of highway and 25,000 bridges and structures using terabytes of climate data to inform a multi-billion-dollar climate adaptation investment program. Meg leads the risk workflow development and research, connecting the pieces for assessing California's transportation infrastructure.

#### Caltrans Highway 1 Climate Adaptation Planning, Ventura County, CA

Risk and Resilience Engineer for climate change adaptation study for the Pacific Coast Highway (PCH), including bicycle and pedestrian infrastructure. The team developed planning-level concepts that would effectively address long-term climate change impacts such as sea-level rise (SLR), storm surge, coastal cliff erosion, and less frequent and more severe rain events, while improving bicycle and pedestrian accessibility within the study area in Caltrans District 7 (in Ventura County). Meg conducted the existing conditions analysis, particularly around the evaluation of coastal hazards (SLR, tsunami, and storm surge), and contributed to the development of planning concepts to address existing risks to the corridor while promoting enhancement of natural environment and access for all users.

#### California High Speed Rail Central Valley Stations, CA

Meg served as a Climate Risk and Resilience Engineer for the development of design and construction documents for the four Central Valley Stations for the California High Speed Rail Authority as part of the joint venture with Fosters + Partners. Meg analyzed downscaled climate data (LOCA2) for mid- and end-of-century timescales and conducted a multi-hazard climate risk assessment for the stations, evaluating flood, wildfire, heat, and wind risk.

#### REDi for Flood, Global

Meg served as a co-Author of the resilience-based flood design guidelines—part of the Resilience-based Design Initiative (REDi™) Rating System—comprised of a holistic process which identifies and mitigates flood risks to enable swift recovery in the aftermath of a major flood. REDi exceeds code-intended performance objectives and typical performance-based design objectives and provides owners and other stakeholders a framework to achieve high-performing buildings and other structures. It requires integrated multi-disciplinary design and performance-based assessment to ensure that an owner's resilience objectives are met. Meg contributed to the risk assessment and downtime methodology from her experience implementing REDi on project work at Arup.

#### First Street Foundation National Flood Risk Assessment, National

Meg served as the Flood Risk Analyst for nationwide flood risk assessment with non-profit partner First Street Foundation. Risk was assessed at every residence, commercial office, and retail building across the United States. Arup developed detailed component-level building models for 80 archetypes to capture differences in building stock like number of stories, construction materials, and use. Meg interviewed mechanical and electric engineers as part of the consequences research for individual building components. She co-developed the archetypes and built up the code base to run the Monte Carlo flood risk analysis in multiple programming languages. She contributed to the final report and worked closely with the client to deliver a high-quality output.



## Jack Hogan, PE

Jack specializes in combining climate adaptation strategies with practical civil engineering and infrastructure planning expertise with a focus on coastal cities and communities.

Jack Hogan is an Associate Climate Risk and Resilience Engineer at Arup based in San Francisco. Jack's work focuses on analyzing and developing engineering and planning solutions that mitigate impacts from flooding, sea level rise, erosion and other climate hazards. Much of Jack's work involves informing decision-making with risk analysis for planning and infrastructure projects. Throughout his 13 years of experience, Jack often leads multidisciplinary teams through assessment, planning, and design efforts for cities, counties, urban districts, rail system, dams, levees, seawalls, highways, bridges, and trails with a focus in California.

### Profession

Civil Engineering

### Current position

Climate Resilience and Adaptation Engineer

### Joined Arup

2017

### Years of experience

13

### Qualifications

M.S., Civil Engineering (Environmental Fluid Mechanics & Hydrology), Stanford University, 2017

US Fulbright Fellow (Department of State), 2015

B.S., Environmental Science and Environmental Engineering, University of California, Los Angeles, 2009

PE State of California (C87443)

### Professional associations

Business Council on Climate Change (BC3)

Urban Land Institute (ULI)

American Planning Association (APA)

American Society of Civil Engineers (ASCE)

Stanford Future Bay Initiative

Stanford Rising Environmental Leaders Program

### Project experience

#### TAM Sea Level Rise Adaptation Planning for the Countywide Transportation System, Marin County, CA

Jack is the Project Manager and lead resilience specialist for the Transportation Authority of Marin's sea level rise adaptation planning project. This project is conducting a countywide SLR vulnerability assessment, developing nature-based adaptation solutions and creating a multi-phased implementation plan.

#### San Francisco Bay Conservation & Development Commission (BCDC) Regional Adaptation Strategy Technical Assistance Program, CA

Arup led the development of a Technical Assistance (TA) Program for local jurisdictions and their partners as they craft their subregional plans for compliance with SB 272's Regional Shoreline Adaptation Plan (RSAP). Jack is leading Arup in their key tasks including conducting background research and engaging municipal stakeholders and coastal resilience professionals to identify priority offerings of the TA program. Arup developed a tactical work plan for BCDC to launch its TA program in 2025 and created a toolkit of resources to support the development of subregional shoreline plans that equitably address sea level rise and its impacts to communities.

#### City of Newark, Sea Level Rise Vulnerability Assessment and Adaptation Strategy, CA

Arup is supporting the City of Newark in assessing their vulnerability to sea level rise and developing an adaptation strategy to protect its shoreline along the San Francisco Bay. Arup is working with local stakeholders to identify critical community infrastructure and co-create possible adaptation strategies that achieve long-term climate resilience while achieving other critical benefits for residents. As part of this work, the team is developing an implementation plan for the City to get projects established with the intention of providing multiple benefits for residents. Jack is Arup's Project Manager.

### Caltrans Statewide Climate Vulnerability and Risk Assessment, CA

Jack is the project manager and lead resilience specialist for a statewide climate change risk assessment. This project analyzes the vulnerability of 50,000 lane miles of highway and 25,000 bridges and structures using terabytes of climate data to inform a multi-billion-dollar climate adaptation investment program.

### Caltrans Coastal Resilience Program, CA

Jack is the Project Manager and lead resilience specialist for a multi-faceted project with Caltrans Headquarters supporting their coastal resilience program. This effort involves developing new research, analysis, and policy guidance aimed at incorporating sea level rise in Caltrans' coastal projects and programs.

### Caltrans Highway 1 Climate Adaptation Planning, Ventura County, CA

Jack led the resilience team on a Caltrans study of climate adaptation and sea level rise protection solutions along a 7-mile stretch of the Pacific Coast Highway. This work involved improving bike and pedestrian infrastructure as well as corridor resilience along a flood and erosion prone stretch of shoreline.

### Sea Level Rise Risk Assessment and Adaptation Prioritization, Oakland, CA

Jack led a coastal flood risk assessment for 50-miles of the San Francisco Bay Trail spanning Alameda and Contra Costa County shorelines. This project involved assessing sea level rise projections, wave climates, storm water levels and shoreline vulnerabilities to inform specific shoreline adaption plans.

### California High Speed Rail Sustainability and Resilience Program, CA

Jack is the Lead Climate Resilience and Adaptation Specialist for a multi-faceted, multi-year project with the California High Speed Rail Authority. This effort involves developing new research, analysis, policy and technical guidance aimed at enhancing the resilience of the High Speed Rail program.

### MTC Shared Work Plan to Address Climate Change, Bay Area, CA

Jack led Arup's contribution to the Bay Area Regional Collaborative's Shared Workplan for Climate Adaptation, which involved facilitating working group meetings with regional agencies and conducting policy research to help align proposed initiatives with existing climate adaptation goals, policies, and strategies from the region.

### Kapalama Canal Resilient Master Plan, Honolulu, HI

Jack led the sea level rise adaptation strategy for a flood control canal and linear park master planning project in Honolulu. This project is being designed to provide enhanced flood protection for the surrounding community and transit-oriented developments up to various mid-century and end-of-century sea level rise planning benchmarks established by the City.

### Hawaii Office of Planning Flexible Adaptation Pathways for Climate Change Planning, Honolulu, HI

Jack led a demonstration study of Flexible Adaptation Pathways Planning for the Hawaii Office of Planning to illustrate best practice in adaptation planning for large, district-scale flood protection infrastructure. This work was part of a larger project that won an APA Hawaii Chapter award in 2020.

### REDi for Flooding Rating System

Jack is the co-author of the REDi for Flooding Rating System (modeled after LEED) which provides a framework for implementing "resilience-based design." The REDi guidelines are aimed at new construction but the conceptual framework can be applied to existing buildings. The version of REDi is being developed specifically for flood hazards.





## Christa Cassidy

Christa enables policy success through data-informed strategies and rigorous project management, with equity and the environment at the center of her approach.

Christa is an urban planner and project manager with over a decade of experience. Her professional background at the intersection of climate, equity, and urban planning allows her to deliver projects with multiple benefits for people and the planet. Christa specializes in projects focused on climate resiliency and adaptation, social equity, and transportation and land use policy.

### Profession

Urban Planner

### Current position

Senior Planner

### Joined Arup

2024

### Years of experience

13

### Professional associations

American Institute of Certified Planners (AICP)

WTS San Francisco Women's Leadership Program, Class of 2023

### Project experience

#### San Francisco Bay Conservation & Development Commission (BCDC) Regional Adaptation Strategy Technical Assistance Program, CA

Arup led the development of a Technical Assistance (TA) Program for local jurisdictions and their partners as they craft their subregional plans for compliance with SB 272's Regional Shoreline Adaptation Plan (RSAP). She spearheaded the stakeholder engagement for this work, convening focus groups, conducting interviews, and distributing a survey to gain key insight into what stakeholders need from the agency's TA Program to be successful in advancing a coordinated regional vision for the shoreline.

#### City of Newark, Sea Level Rise Vulnerability Assessment and Adaptation Strategy, CA

Arup is supporting the City of Newark in assessing their vulnerability to sea level rise and developing an adaptation strategy to protect its shoreline along the San Francisco Bay. Christa is working with local stakeholders to identify critical community infrastructure and co-create possible adaptation strategies that achieve long-term climate resilience while achieving other critical benefits for residents. As part of this work, she is developing an implementation plan for the City to get projects established with the intention of providing multiple benefits for residents.

#### Transportation Authority of Marin (TAM), Sea Level Rise Adaptation Planning for Marin County's Transportation System

Christa developed an implementation plan for a suite of adaptation strategies that will help protect Marin's transportation assets against the impact of sea level rise and flooding. These adaptation strategies will address critical community assets and center the needs of equity priority communities within the County who are most vulnerable to the impacts of climate change. The implementation approach aims to identify context-specific policies and programs in addition to physical measures with an eye toward partnerships and funding.

### Metropolitan Transportation Commission (MTC) and State Coastal Conservancy (SCC), Bay Area Regional Advance Mitigation Planning (RAMP) Program, Bay Area, CA

Christa was the Project Manager for the Bay Area RAMP Program, an initiative spearheaded by MTC and SCC to improve transportation project delivery and leverage valuable mitigation dollars for smarter and more strategic conservation. She worked to foster relationships across federal, state, and local transportation and resources agencies to build the regulatory framework and political will needed for program adoption into the region's long-range transportation plan, Plan Bay Area. As part of this work, she developed policy language and performed advocacy to pass AB 2087, which established Regional Conservation Investment Strategies, an innovative approach to develop mitigation credits for transportation agencies to mitigate project impacts.

### Bay Area Greenprint, The Nature Conservancy, CA

Christa was the Project Manager for a collaborative effort to build an innovative tool called the Bay Area Greenprint which reveals the multiple benefits of natural and agricultural lands in the region and empowers users to inform land use decisions with better data. Christa managed the science, policy, and outreach strategies necessary for uptake among practitioners and policymakers, resulting in the tool's adoption as an evaluation method for one of the Metropolitan Transportation Commission's grant programs. As part of the Greenprint, Christa managed the development of the Mitigation Wizard tool which helps predict a transportation project's impacts on species and habitats that might require mitigation and then helps to locate protection or restoration projects.

### Pajaro Compass, The Nature Conservancy, Pajaro, CA

Christa was the Project Manager for an ongoing conservation planning initiative and network in the Pajaro River watershed, called the Pajaro Compass. Christa shaped the outreach and engagement strategy for a complex and divergent group of stakeholders to understand community needs, identify shared goals for the watershed, and develop the strategies needed to achieve the network's vision. She led the writing and editing process for the document which codifies two years of community input and serves as a blueprint for the network going forward.

### East Alameda County Comprehensive Multimodal Corridor Plan (CMCP), CA

Christa served as Project Manager for the East Oakland and Central County CMCP. In this role she oversees a discrete workstream focused on advancing equity within the project. Specifically, she and her team developed an equity performance assessment of existing and future conditions within the project corridor and an equity evaluation of the projects selected for inclusion in the CMCP. As part of this she developed recommendations on strategies to improve equity outcomes for the overall CMCP.

### Oakland Racial Equity Impact Analysis (REIA), Oakland, CA

Christa served as Project Manager and lead researcher and writer of the development of a REIA for the City of Oakland's segment of the East Bay Greenway Multimodal Project, a 10.6-mile-long regional active transportation facility that connects two San Francisco Bay Area Rapid Transit (BART) stations. The analysis she conducted examined the racial disparities for key metrics, like safety and displacement, to elevate disproportionalities between communities in the project corridor and Oakland overall and determined the extent to which the project would advance racial equity goals.

### BART and Capitol Corridor, Link21, CA

Christa was the Land Use Lead for the multibillion-dollar Link21 Program, which aims to create a faster, more connected, equitable, and accessible network of train service across 21 counties and 160 cities. In this role, she developed and directed the implementation of a land use strategy across five discrete service categories representing a consultant team of over 500 people. She developed local land use policy guidance, as well as metrics for assessing the land use and displacement risk associated with different program concepts. She also collaborated across agencies to develop an anti-displacement policy toolkit for cities that may be impacted by Link21.

**Profession**

Coastal Engineer

**Current position**

Senior Engineer

**Joined Arup**

2023

**Years of experience**

14

**Qualifications**

PE (NY)

B.S., Ocean Engineering, Texas  
A&M University, College Station,  
TX, 2007

M.E., Ocean Engineering, Texas  
A&M University, College Station,  
TX, 2009

**Professional associations**

Marine Technology Society,  
member since 2001

PIANC, Member since 2018

## Robert Acker

Robert's experience across multiple types of maritime projects gives him a detailed understanding of the complexities inherent in such jobs, and how to manage them on schedule and budget.

Robert has 15 years of experience in coastal engineering and numerical modeling. Past coastal engineering work includes the application of state-of-the-art wave, hydrodynamic, and sediment transport models; experience with the techniques and equipment used to collect data in the coastal environment, including tides, currents, bathymetry, and waves; and design experience with flood protection systems, shoreline erosion treatments, piers, boardwalks, and bridges. He has also reviewed and advised several port authorities on resiliency upgrades and natural disaster mitigation utilizing both passive and active protective designs.

**Project experience****Wharf District Council Resiliency Plan, Boston, MA**

With funding from the Commonwealth of Massachusetts, the Wharf District Council is collaborating with the City of Boston and Wharf District Stakeholders to develop a flood resiliency concept plan for the Wharf District. This project will incorporate community priorities & preferences, integrate prior flood resilience initiatives by the City and Wharf District property owners, address site-specific considerations and advancements in flood predictions, and identify viable resiliency design, permitting, and funding strategies to deliver district-wide flood protection. A range of flood resiliency strategies will be assessed for engineering viability, resulting in the identification of preferred strategies for each waterfront property. Where preferred strategies would require regulatory modification(s), alternative strategies will also be identified.

**Cleveland Harbor Eastern Embayment Resilience Strategy (CHEERS), Cleveland, OH**

Robert is responsible for the marine QA/QC, cost estimation, and design oversight for the advancement and design of CHEERS. This 80-acres of new parkland aims to reconnect communities to the lake, improve public health, bolster the economy, and benefit the environment and natural habitat.

**False Creek South Phase 1, Vancouver Canada**

The City of Vancouver is seeking multidisciplinary support to develop a comprehensive plan for the development of False Creek South, an area of about 55 hectares surrounding Granville Island. The City owns 80 percent of the land and Council has articulated a progressive vision that calls for pushing the bounds in terms of tenure and construction to foster social mixity, climate resilience, etc. The City plans to retain ownership and continue the use of



ground leases, which offers significant flexibility to implement broad-reaching plans.

#### False Creek South Conceptual Development Plan, Vancouver, BC

Arup, as lead consultant, is providing the City of Vancouver multidisciplinary support to develop a comprehensive plan for the development of False Creek South, a 55-hectare waterfront community first developed in the 1970s on former industrial land. Vancouver City Council has set an ambitious vision for False Creek South, aiming to redefine how urban land is used to promote social diversity, climate resilience, and innovative housing solution.

#### Port de Contrecoeur, Canada

Provided review and technical comment as owner's representative for ongoing Ports work. Including review of best practices, ice impacts, construction methods, and berthing options.

#### IO Marina Development and Design Study, Toronto, Canada

Worked with client to provide conceptual plans for upgrading an existing marina site. Developed optimized layouts and berthing solutions based on financial models and research into the local market. Worked within the constraints of ongoing site improvements with multiple stakeholders to assist the client with the final piece of the overall destination space.

#### New Stapleton Waterfront Development Phase 1, 2, & 3\*, New York City Economic Development Corporation, New York, NY

Managed a multi-year contract to design shoreline protection/treatment options to bring a deteriorated industrial area under New York City Parks oversight and provide for expanded public and private infrastructure. Led design efforts, managed accounts, coordinated permit modifications and agency interaction. Integrated resilient engineering design efforts and mitigation planning/requirements.

#### City of Virginia Beach Sea Level Rise and Recurrent Flooding Studies, Virginia Beach VA\*

The City of Virginia Beach sought to pro-actively address recurrent flooding issues by systematically assessing existing and future vulnerability, assessing and prioritizing adaptation strategies and then implementing short- to long-term planning and policy measures that increased resiliency. These efforts would be undertaken in each of the four major city watersheds (Elizabeth River, Lynnhaven, Atlantic Ocean, Southern Watershed) and outputs of the analysis would result in specific and actionable Response Plans for each watershed. Led design engineering analysis and review for numerous task orders of the overall study effort.

#### Coastal Geology Program Coastal Engineering Review, National Parks Service, Various locations in the US\*

Prepared technical review memorandums on numerous National Park Service Coastal Units. Reviews included engineering design on projects going to bid, neighboring coastal hardening projects and potential impacts to Parks assets, and early design concept compliance with overall Parks missions. The Coastal Geology Program of the Geologic Resources Division requested an internal document to make other National Park Units aware of the contract vehicle to bring similar engineering review items to the team and utilize the technical expertise available under this contract.

#### Dundalk Marine Terminal Groundwater Intrusion Support, Maryland Port Authority, Baltimore, MD\*

Prepared technical review notes and recommendations on coastal resilience options being pursued by Dundalk Marine Terminal to maintain port operability for the next 30 years. Review included potential impacts to and complications from existing environmental contamination on the site (chromium ore processing residue) and the potential hydraulic pathways the contamination may transmit. Attended numerous stakeholder meetings and discussions with Maryland Port Authority.

\*Experience prior to joining Arup



## Audrey Fremier

Audrey delivers integrated water solutions through technical leadership in hydraulic modeling, climate resilience planning, and interdisciplinary project coordination.

Audrey has a strong background in project management, technical leadership, and hydraulic modeling across a wide range of water infrastructure and climate adaptation projects. She has served as a project manager, task lead, and technical reviewer on complex assignments involving stormwater systems, fire water networks, and flood risk assessments. Audrey brings deep expertise in hydrologic and hydraulic modeling tools such as EPA SWMM, InfoWater Pro, and HEC-RAS, and applies these skills to support resilient infrastructure design and regulatory compliance. Her work spans urban and rural contexts, with a focus on integrating climate risk, sustainability, and nature-based solutions into water system planning and design.

### Profession

Water Engineering

### Current position

Water Engineer

### Joined Arup

2018

### Years of experience

7

### Qualifications

BS Environmental Engineering,  
California Polytechnic State  
University, San Luis Obispo, 2017  
PE, State of California (#97703)

### Publications

2020 International Conference on  
Water Management Modeling

### Project experience

#### Sea Level Rise Vulnerability and Adaptation Assessment, Newark, CA

Arup is providing end-to-end support for the City of Newark which lies along the San Francisco Bay waterfront, from compound flood hazard modelling through climate adaptation strategies for major infrastructure assets. Audrey is supporting the flood hazard model development considering rising sea levels, rising groundwater, subsidence, storm flows, and storm surge. The present and future flood inundation and depths will inform a vulnerability and damage impact assessment which will be utilized to identify key flood risk areas. Audrey will develop adaptation solutions to mitigate the impacts of flooding and enhance the resilience of the communities and infrastructure in Newark.

#### Constructed Wetland Hydraulic Analysis, Concord, CA

Audrey assisted in managing the project and performed hydrologic and hydraulic modelling for the City of Concord to validate the concept of creating constructed wetlands for a 5,000-acre redevelopment of the Concord Naval Weapons Station. She evaluated the effectiveness of proposed constructed wetlands from a surface and groundwater flow perspective. Using XPSWMM, she modeled the 100-year storm event, validated the results with FEMA data, and verified that water levels in the wetlands would satisfy ecological design parameters. Audrey also sized culverts for a proposed roadway running through the site and presented project updates for the groundwater, site development, and surface water modelling. Audrey coordinated design criteria with permitting and wetland ecologist experts, and several Arup disciplines.

#### Kapalama Canal Catalytic Project, Honolulu, HI

Arup led the sea level rise adaptation strategy for a flood control canal and linear park master planning project in Honolulu. This project is being designed to provide enhanced flood protection for the surrounding community and transit-oriented developments up to various mid-century and

end-of-century sea level rise planning benchmarks established by the City. Audrey conducted hydraulic modelling in HEC-RAS to evaluate the effects of sea level rise and dredging the canal. She performed a scour analysis for a bridge in the canal following HEC-18 procedure.

#### Site Due Diligence, San Francisco Bay Area, CA

Audrey was the Project Coordinator for the Arup lead team of ERM, Gensler and JMH Weiss developing a Due Diligence report for a 50+ acre site with scope encompassing water infrastructure engineering, geotechnical engineering, transportation planning, sound and vibration analysis, blast risk analysis, and land surveying. Audrey conducted the flood risk analysis of the site and identified critical issues including flood mitigation strategies for the site in a flood plain.

#### Stormwater System QA/QC, Sacramento International Airport (SMF), Sacramento, CA

Served as the technical reviewer for the stormwater system model supporting a new roundabout design at SMF. Led quality assurance and quality control of the EPA SWMM model, which incorporated the proposed storm drain system and its connection to existing infrastructure. Verified compliance with Sacramento County Improvement Standards, including hydraulic grade line (HGL) requirements, minimum and maximum velocity thresholds, and freeboard criteria. Assessed model performance through HGL profiles and velocity checks and provided recommendations to improve hydraulic performance and documentation for future permitting or reporting needs.

#### Coastal Tribal Climate Impact Exposure Assessment, US

Technical lead for data collection and hazard analysis for a national-scale climate exposure assessment supporting the Institute for Tribal Environmental Professionals and the Bureau of Indian Affairs. Led the compilation and validation of geospatial datasets representing Tribal lands, buildings, and roads across 45 federally recognized coastal Tribes in the contiguous U.S. Oversaw the integration of multiple climate hazard datasets including sea level rise, storm surge, high tide flooding, Great Lakes water level rise, erosion, and compound flooding, under the SSP5-8.5 emissions scenario. Directed the development of a geospatial analysis framework to quantify asset exposure across multiple time horizons (2020 to 2100), enabling high-level estimates of climate risk to Tribal infrastructure. Results informed adaptation planning and future resilience strategies for Tribal communities facing relocation or protect-in-place decisions.

#### Confidential Multi-hazard Shared Fate Risk Assessment: Singapore, Frankfurt, Tokyo, and Ohio

Performed a qualitative risk assessment to 38 sites and the shared infrastructure (utilities and roads) while incorporating the impacts of climate change and sea level rise. Audrey led the assessment of flood risk to the sites from riverine, stormwater, storm surge, and dam breaks. Audrey collaborated with local Arup engineers to understand the country design criteria, impacts of urbanization, and any region-specific rainfall hazards and flood risk. The preferred sites were recommended considering the exposure, vulnerability, consequence, and risk rating from 23 natural hazards and manmade due to adjacency hazards.

#### Climate and Disaster Risk Assessment for the Fanga'uta Lagoon Crossing Project, Tonga

Delivered a risk assessment of climate change, flood hazards, and seismic hazards as part of the Asian Development Bank's Climate and Disaster Risk Assessment for the proposed lagoon crossing in Tongatapu, Tonga. The focus of the Fanga'uta Bridge Climate and Disaster Risk Assessment is to evaluate the impacts to the project regarding reliability of connectivity benefits provided by the bridge and its primary access roads over time. Audrey evaluated six hazards plus the impact of sea level rise, temperature change and precipitation changes regarding the project's ability to provide an evacuation route in the event of a tsunami and extreme weather events, facilitate long-term climate change-induced relocation, and to provide shorter journeys for residents.





## Richard Lagesse

Richard is an effective project manager with a proven track record of delivering complex civil engineering and planning projects. He has successfully led multidisciplinary teams and international field missions for unique and high-profile projects.

### Profession

Geology

### Current position

Project Manager

### Joined Arup

2011

### Years of experience

12 Years

### Qualifications

BEng Engineering Geology & Geotechnics, First Class Honours, The University of Portsmouth, UK

MSc DIC Soil Mechanics & Engineering Seismology, Imperial College London, UK

### Publications

Lagesse, R. H.; Hambling, J.; Gill, J. C.; Dobbs, M.; Lim, C; Ingvorsen, P. (2021). The role of engineering geology in delivering the United Nations Sustainable Development Goals. Quarterly Journal of Engineering Geology and Hydrogeology.

Lagesse, R. H.; Free, M. W.; & Lubkowski, Z. A. (2017). Probabilistic Seismic Hazard Assessment for Libya. 16th World Conference on Earthquake Engineering. Santiago, Chile.

Richard is a Senior Project Manager with 12 years' experience in geotechnical engineering, engineering geology, natural hazard risk and resilience and project management. He has diverse global experience in established and emerging markets and has been engaged on a wide range of infrastructure, buildings and consulting projects in Asia, Australasia, the Middle East, Africa, Europe and the Americas. Core technical experience includes ground characterization, natural hazard and risk assessment and geotechnical advisory to planning projects. Along with proficient application of digital solutions on projects, Richard's skill set is complimented by extensive international field experience on site investigations, field mapping assignments and post-disaster missions. He is an effective manager with a proven track record of delivering complex civil engineering and planning projects. He has successfully led multidisciplinary teams and international field missions for unique and high-profile projects.

### Project experience

#### Caltrans D7 Climate Change Adaptation of PCH Bicycle and Pedestrian Infrastructure, Ventura County, CA

Richard was Geotechnical Lead for a climate change adaptation study for the bicycle and pedestrian infrastructure along a 7-mile stretch of the Pacific Coast Highway (PCH). The study includes developing planning level concepts and strategies that effectively address long term climate change impacts such as sea level rise (SLR), storm surge, coastal cliff erosion, and less frequent and more severe rain events, while improving bicycle and pedestrian accessibility within the State Route 1 (SR-1) study area. These conceptual plans and methodology will then be used by Caltrans for alternatives analysis and as guidance to inform various planning documents and future projects across the State.

#### Bay Area Rapid Transit (BART) Silicon Valley Phase II (BSVII) – Contract Package 2 (CP2), San Jose, CA

Richard was the ground modelling technical lead for the second phase of the Santa Clara Valley Transportation Authority's (VTA's) BART Silicon Valley Program to expand BART services into Santa Clara County and Downtown San Jose. This progressive design and build project included design of five miles of tunnel and track packages with integration into three underground stations and two mid-tunnel facilities and associated structures. Richard's role included geotechnical database management and 3D ground modelling using Leapfrog Works to inform design of geotechnical elements and property protection assessment.

### UCLA Station Seismic Soil-Structure-Soil Interaction Analysis, Los Angeles, CA

Richard was project manager for seismic structure-soil-structure interaction (SSSI) services under contract with GeoPentech in connection with a proposed tower that will be located at 10955 Wilshire Boulevard in Los Angeles, California adjacent to the Wilshire/UCLA Metro Station that is currently under construction. The scope of work involved carrying out seismic SSSI analyses of the UCLA Station for scenarios with and without the Tower present using the finite element software LS-DYNA. The purpose of the analyses is to evaluate the potential influence of the Tower on the structural demands of the Station in the event of an earthquake.

### A120 Bypass (Little Hadham) and Flood Storage Reservoirs, Hertfordshire County Council and Environment Agency, UK

Richard was on-site Geotechnical Supervisor for two Large Raised flood storage reservoirs and a flood diversion channel as part of the A120 Little Hadham bypass road. Richard oversaw the earthworks construction for new bridges and highways as well as the reservoir design aspects of the project, including the spillway structures, culverts, diversion channels and scour protection.

### Lower Alemany Stormwater Improvement Project, San Francisco, CA

Richard was project manager where Arup were commissioned by McMillen Jacobs on behalf San Francisco Public Utilities Commission (SFPUC) to provide specialist hydraulic and seismic analysis services for the upgrading of the local sewer and stormwater drainage network in the Lower Alemany and Islais Creek areas of southern San Francisco. The scheme involved construction of a new 1.25-mile long 12-foot diameter sewer tunnel and associated shafts, as well as upgrading existing auxiliary sewer infrastructure, with the aim of improving local drainage and reducing flood risk. Arup's key role was to ensure the scheme achieved hydraulic and seismic resiliency by carrying out advanced analyses of hydraulic performance, as well as potential structural and ground deformations due to seismic ground shaking.

### A303 Amesbury to Berwick Down, Stonehenge, UK – Ground Investigation

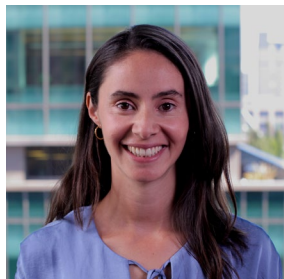
Richard provided part-time site supervision for this ground investigation aimed at informing preliminary design and planning requirements for the proposed upgrading of the A303 between Amesbury and Berwick Down. The geology at the site required special attention to the geological logging, descriptions and classification of phosphatic chalk with training sessions with *Rory Mortimer*.

### Riyadh Metro Project, Package 1 Stations and Tunnel Approach, Riyadh, Saudi Arabia

Richard prepared the geotechnical interpretive report (GIR) for the design of temporary and permanent works for proposed stations and tunnel approach. This included an interpretation of site-specific ground conditions including the hydrogeological regime, derivation of geotechnical design parameters, rock mass properties, lateral rock pressures and an assessment of geotechnical risk.

### Seychelles Strategic Plan, The Seychelles

Richard developed a disaster risk profile for landslide hazards in The Seychelles and outlined a provisional risk management strategy and assessment methodology. He also provided geotechnical input to key planning documents to inform strategic decision making. This comprised an appraisal of ground conditions utilizing remote sensing and GIS analyses to identify geohazards and assess impacts on regional development.



## Daniela Zuloaga Romero

Daniela is an Associate at Arup and has more than a decade of experience as a disaster risk specialist conducting multi-hazard qualitative and quantitative assessments (for hydrometeorological and geophysical hazards and incorporating climate change effects) and in developing disaster and climate change risk mitigation and resilience strategies.

### Profession

Civil Engineering

### Current position

Senior Risk and Resilience  
Consultant, Associate

### Joined Arup

2021

### Years of experience

11

### Qualifications

Climate Change Professional  
(CC-P), Certified by the  
Association of Climate Change  
Officers, 2023

Certificates in Climate Risk  
Assessment for Infrastructure &  
Facilities – 2020

Certificate in Statistical  
Downscaling of Global Climate  
Models using SDSM 5.2 – 2016

Certificate in Project  
Management for Development  
Projects - 2016 EdX Inter-  
American Development Bank

MSc in Civil Engineering  
(Structural and Earthquake  
Engineering) - 2014 Illinois  
Institute of Tech, Chicago, IL

Bachelor's in Civil Engineering  
– 2011 Universidad de los  
Andes, Bogotá, Colombia

At Arup she has led and participated in projects in the U.S., Colombia and Asia for both private and public sector clients. Before joining Arup, Daniela worked in the Inter-American Development Bank (IDB) where she worked incorporating disaster and climate change risk considerations in projects of the infrastructure, urban and social sectors (transportation, energy, agriculture, water, education, health and urban rehabilitation) across Latin America and the Caribbean (LAC). Prior to that, Daniela worked for engineering firms in Colombia as an expert probabilistic risk modeler for projects in LAC, including Colombia, Brazil, Ecuador, Perú, Argentina, and Chile among others, and for the United Nations Office for Disaster Risk Reduction Global Assessment Report 2015.

### Project experience

#### California High Speed Rail Central Valley Stations, CA

Climate Subject Matter Expert and Lead. Arup is developing design and construction documents as part of joint venture with Fosters + Partners for the four Central Valley Stations - high-speed rail station sites - in Merced, Fresno, Kings/Tulare, and Bakersfield. Multidisciplinary and full feasibility study, design, construction management professional services relating to development of the high-speed rail stations. Under the sustainability scope, resilience and adaptation is a key component where Arup is reviewing the Authority's resilience requirements, conducting multi-hazard risk assessments and working with the multiple design teams to inform design with resilience measures. Detailed climate data investigation to collect and analyze the latest projections from the global climate models for California into a risk assessment which results are being incorporated at each stage of the stations design.

#### Multi-hazard risk for Bristol Commons, Orange County, CA

Risk and Resilience Study Lead. Sustainability consulting for a 42-acre mixed use, primarily residential, 2 block parcel in Orange County, California. Develop a sustainability and wellness narrative and project strategy that considers disaster risk and resilience, entitlement risk, regulatory and industry trends, and assesses long-term value return of sustainable site development opportunities. Support early site-development concepts which can be integrated into the overall pro-forma for construction and operational costs. The resilience study involved conducting a qualitative (Class 1) multi-hazard (geophysical and hydrometeorological) screening-level risk assessment for the development to identify critical hazards and risks, obtain risk ratings and provide recommendations.



### Cluster Resilience Study, Bay Area, CA

Climate Change Lead for flooding & flooding shared fate hazard lead. Quantitative (Class 3) multi-hazard risk assessment of a portfolio of 12 existing and new data centers around the Bay Area in California. The objective is to conduct an in-depth evaluation for flooding, seismic, heat and air quality risks following a prioritization from a previous qualitative evaluation, and provide risk mitigation measures and recommendations. It involved: (i) probabilistically modeling the hazards (including climate change in the flooding and heat hazards) through complete and site-specific hydrologic-hydraulic modeling and climate change statistical downscaling, site-specific ground shaking modeling including liquefaction for earthquake, and site-specific temperature and humidity evaluation for heat; (ii) probabilistically modeling the vulnerability at building and component level, and (iii) probabilistically computing individual and shared fate risk in terms of downtime (average annual downtime, probability of downtime for varying timeframes).

### Multi-hazard risk assessment for key infrastructure in Avarua, Cook Islands

Technical Lead and coordinator for flood modeling and climate change. Arup and ORCAS (previously eCoast) are conducting a multi-hazard resilience scope of work in two phases.

In Phase 1, we conducted a fully probabilistic flood and extreme heat risk assessment for the port and airport in Avarua, Cook Islands. Coastal and inland flood hazards were assessed independently and coincidentally, where a stochastic event generation technique for cyclonic and non-cyclonic storms was used, using the SWAN, XBEACH and TUFLOW software, along with parametric models for sub-hazards. Climate change was included in the modeling for 2050 and 2100 under SSP5.8.5. Individual asset and component-based vulnerabilities were modelled. The impacts the port, airport and other critical infrastructure was assessed, estimating metrics that include damage, financial losses, and downtime. A broader economic impact model was also developed to understand the larger operational and business consequences to these critical assets. A comprehensive capacity building plan was developed and implemented throughout via a series of workshops with stakeholders to socialize, present, consult and train local people and end users on the methods and results.

In Phase 2, we are using the previous results to develop a resilience and adaptation strategy. Initially, we are developing a long-list of resilience measures, based on a prioritization of key asset-hazard pairs with the highest risk and that contribute the most to a system-wide operational resilience goals. This long list is being discussed and co-created with the stakeholders, after which it will be adjusted to a short-list of options. This short list will be used to re-run the risk models to quantify the risk reduction (benefit) and then quantify costing to do a cost-benefit analysis (CBA). The results will be used by the Port and Airport authorities to plan improvements works.

### Climate Risk and Resilience Assessment in Alignment with TCFD Recommendations, USA and Puerto Rico

Project Manager. Multi-hazard risk specialist. Qualitative (Class 1) multi-hazard (natural) risk assessment of existing and new biotechnology and pharmaceutical facilities at three campuses in the USA and Puerto Rico, and quantitative (Class 3) hurricane risk assessment of existing facilities at the campus in Puerto Rico. The objective of the Class 1 is to conduct a screening level assessment to identify the key risks for the facilities and propose high level recommendations. It involves evaluating the integration of hazard, exposure, and vulnerability to obtain risk ratings. The objective of the Class 3 is to conduct an in-depth assessment focused on cyclonic wind and flood hazard to quantify risks and provide site-specific risk mitigation measures. It involves modeling the integration of hazard including climate change, exposure and vulnerability to obtain key risk metrics for decision making: average annual loss/downtime and probability of loss/downtime in various timeframes.

\*Experience prior to joining Arup



## Adam Finkin

With a focus on cost estimating, cost planning, scheduling, risk, and construction management Adam's strong leadership qualities and technical skills bring value to any project.

Adam Finkin is an Associate Cost Engineering Analyst leading the Arup Americas Risk Management offering. Adam has experience in construction management, cost estimating, cost planning, cash flow projections, scheduling, value engineering, risk management, risk analysis, and life cycle cost analysis.

Adam's projects span both heavy civil infrastructure and buildings within the Americas and globally. Several notable projects include the CA High Speed Rail, Transbay Terminal, Long Baseline Neutrino Facility Tunnel Excavations, Presidio Parkway, Tappan Zee Bridge, Goethals Bridge P3, Green Line Extension, Doha Confidential Tunnel & Bridge project, LA Convention Center, New Mexico City Airport and Terminal, Confidential Campuses in the Bay Area, and the New Bridge Saint Lawrence.

He has performed Lender's Technical Advisory roles specific to due diligence, CAPEX and OPEX analysis, project due diligence, schedule analysis, risk analysis, and Maximum Probable Loss modeling for investment evaluation and insurance purposes. Adam also has experience in business administration, finance, financial modeling, and is project manager for an Arup DTF research project studying the integration of BIM and cost analysis, as well as an effort in collaboration with UC Berkeley and U Washington studying project delivery methods and transaction costs.

### Project experience

#### California High Speed Train Project (CHSTP), CA

Cost estimating, scheduling and constructability reviews for the 195-mile-long section of the project from Palmdale to Fresno. Primary features include twin bore tunnels, aerial structures, grade separation bridges and viaducts. Total project estimated at \$42bn, estimated cost for this segment is \$7bn.

#### Presidio Parkway, San Francisco, CA

Cost Estimating Support responsible for managing and delivering detailed design and construction procurement documents for an approximately \$1bn complete replacement of Doyle Drive, a 1.6 mile long 6-lane highway connecting San Francisco city streets through the Presidio of San Francisco National Park to the Golden Gate Bridge.

#### Los Angeles Convention Center, Los Angeles, CA

Arup worked with the City of Los Angeles on the redevelopment of the Los Angeles Convention Center. Adam helped develop a business case comparing the traditional design delivered using CM-at-risk with a separate design, build, finance, operate, and maintain (DBFOM) design scheme. Arup's team provided

#### Profession

Cost Management & Quantity Surveying

#### Current position

Associate

#### Joined Arup

2007

#### Years of experience

16

#### Qualifications

BA, Literature and Business, State University of New York at Albany, 2005

Certificate in Construction Management, UC Berkeley Extension Certified Professional Estimator

LEED Accredited Professional American Society of Professional Estimators

integrated technical, commercial, risk, and financial advice, while Adam led the quantitative risk analysis.

#### Concord Community Reuse Plan, Concord, CA

Development of cost projections for the mixed-use redevelopment a 5,000-acre greenfield site.

#### Transbay Transit Center, San Francisco, CA

Prepared cost estimates for a cable stayed bridge main span and seven alternative bus ramp alignments for the Transbay Transit Center.

#### Lawrence Berkeley National Labs Oakland Science Facility (OSF), Oakland, CA

Developed estimates for the National Energy Research Scientific Computing Center (NERSC) power upgrade at its current facility, located at the Lawrence Berkeley National Laboratory Oakland Scientific Facility (OSF).

#### Richards Boulevard Office Complex, Sacramento, CA

Provided cost support for a 1,250,000ft<sup>2</sup>, 17-acre campus for 5,000 state employees in the River District, a developing area of Sacramento. Arup is the prime on the Criteria Architect/Engineer team and provides 23 of the over 30 disciplines who developed the project criteria, assisted in selection of the design-build team, and continue to support Department of General Services (DGS) with reviews of the developing design and construction. This is the largest project the DGS has undertaken to date. Arup developed an independent perspective of program construction costs and participated in a cost reconciliation with the design and owner's project teams.

#### San Francisco/Oakland Bay Bridge Pedestrian Path, CA

Arup is providing design, cost, and risk analysis for a proposed bike / pedestrian path to be incorporated onto the existing west span of the SF/Oakland Bay Bridge. The new east span project includes a path from Emeryville to Treasure Island, with no provision for access to San Francisco. Arup is evaluating options to make a connection from SF to Treasure Island allowing for pedestrian access across the bay. Adam is leading the cost and risk analysis which supports the decision-making process for this project.

#### Long Beach Civic Center, Los Beach, CA

Arup was the lead advisor to the City of Long Beach for the development of a new Civic Center consisting of a new City Hall, Main Library, Lincoln Park (5 acres), and new permanent Port Headquarters in downtown Long Beach. Under advisement of Arup, the City reached financial close with Plenary-Edgmoor Civic Partners to develop, design, build, finance, operate, and maintain the New Long Beach Civic Center, Port Headquarters, and potential related downtown development. Arup provided technical, commercial, and financial advice, as well as coordinating closely with legal advisors, to assist the City structuring the project and develop project agreements in concert with its private partner. Adam was a key team member focusing on market sensitivity, escalation forecasting, and economic modelling.

#### PANYNJ Design-Build Advisory Services, NY and NJ

Cost Engineer providing programmatic design-build advisory services to the Port Authority of New York & New Jersey (PANYNJ). Arup is advising the agency on DB best practices, capital project procurement strategies, industry outreach efforts, standardized contract documentation and internal training initiatives. Providing cost-focused lens to DB procurement process best practices.

#### Amtrak Penn Station New York Expansion, New York, NY

Cost Engineer. Architectural and engineering services for preliminary engineering of the expansion of Penn Station New York on behalf of Amtrak / NJ TRANSIT and the Metropolitan Transportation Authority. The project supports the preparation of a federal environmental impact statement prepared in accordance with the National Environmental Policy Act. The expansion of Penn Station New York is a component of the Gateway Program.



**Profession**

Project Management

**Current position**

Associate Bridge Engineer

**Joined Arup**

2013

**Years of experience**

12

**Qualifications**

MS, Civil and Environmental Engineering, California Polytechnic State University, San Luis Obispo, 2012

BA, Architecture minoring in Structural Engineering, University of California, Berkeley, 2010

EIT, State of California (#147603)

ENV SP, Institute for Sustainable Infrastructure (#19886)

PE, State of California (#84342)

**Publications**

Goel, R.K., Qu, B., and Tures, J., "Realization and Verification of the Fault - Rupture Response Spectrum Analysis Procedure for Bridges Crossing Earthquake Fault Ruptures" Seventh National Seismic Conference on Bridges & Highways, Oakland, CA, 2013.

Tures, J., Goel, R. K., Qu, B., "Validation and Implementation of a Simplified Analysis Procedure for Bridges Crossing Earthquake Fault Ruptures" 2013 Structures Congress. Pittsburgh, PA, 2013.

## Jennifer Sudario

Jennifer is a successful collaborator who leverages her design-build engineering experience and passion for integrated design in managing multi-disciplinary infrastructure projects.

Jennifer Sudario is a Project Manager and Senior Bridge Engineer and who joined Arup in 2013. After 5 years with Arup's San Francisco office, she relocated to Los Angeles to lead the technical delivery of 9 miles of complex retaining walls for the I-405 Improvement Design-Build Project. For over 2 years she worked tirelessly with our design joint venture partners, design-build contractor, and owner to expedite the project delivery from the Orange County Design-Build Integrated Project Office. She brings this on-site design-build experience into her current role in Project Management for Arup's West Coast Region.

Her expertise is in civil structures, soil-structure interaction and seismic design including reinforced concrete tunnel portal structures, cut-and-cover tunnels, complex retaining walls, sound walls, and other buried structures. Additionally, Jennifer has design experience for pedestrian and roadway bridges, high-speed rail viaduct structures as well as load rating and asset management.

**Project experience****I-405 Improvement Design Build Project, Orange County, CA**

Technical Lead for standard and non-standard retaining walls within the \$1.2bn I-405 Improvement Design Build Project. Orange County Transportation Authority (OCTA) in cooperation with Caltrans selected OC 405 Partners to design and construct this project. Key elements of the approximately 16-mile widening project include: a general-purpose lane in each direction of I-405 from Euclid St to the I-405/I-605 Interchange, addition of a tolled express lane in each direction from SR-73 to SR-22, reconfiguration of interchanges and ramps comprised of 23 new or replacement crossroad/ramp bridges, one pedestrian bridge, coordination with utility owners for relocation of known utilities and seven bridge widenings.

Jennifer executed the project delivery of 11 miles of highway retaining walls and sound walls including Caltrans Standard Cast-in-place walls, MSE walls, sound walls and non-standard walls designed on piles or with lightweight backfill to combat settlement. She is the Engineer of Record for 15 non-standard retaining walls designed to meet AASTHO and Caltrans standards with high seismic considerations. The use of Lightweight Cellular Concrete (LCC) as retaining wall backfill was successful in minimizing the use of piles and adding value for the contractor. Jennifer was key in getting this wall type design approved by OCTA and Caltrans in partnership with the Contractor Joint Venture. Reviewing Bridge Engineer for the I-405 highway improvement bridge overcrossing replacement works located in Orange County.

Jennifer performed an independent design review of the overpass bridge design for Slater and Bolsa Chica Avenue foundation design per Caltrans SDC. Bridge types include concrete pre-stressed box girder and California bulb-tee pre-cast girder bridge. Design check performed in Midas Civil.

#### **LAX Bus Yard Facility Relocation, Los Angeles, CA**

Structural Lead for the relocation of Facility Management and Utility Group (FMUG) storage yard, a new bus parking pad, and a new single-story building, employee parking lot improvement, a new Los Angeles Department of Water and Power (LADWP) industrial station (IS), and other miscellaneous improvements.

#### **LAWA On-Call, Los Angeles, CA**

Deputy Project Manager within HOK+Arup Joint Venture appointed by Los Angeles World Airports (LAWA) as their principal architect and principal engineer. This contract replaced eleven different on-call contracts at LAX with a single appointment, covering any tasks and studies the airports wish to pursue.

Jennifer manages Arup's planning and engineering services as part of a \$7.5m task order for LAX Airport Planning Airfield & Terminal Modernization Project Implementation Study. This includes the project management of Arup's terminal planning, airfield planning, and traffic engineering as well as the services of seven sub-consultant teams.

#### **Gerald Desmond Bridge Replace Erection Manual, Long Beach, CA**

Bridge Engineer for erection manual for a two-tower, six-lane, cable stayed bridge that provided ample vertical and horizontal clearance to accommodate the newest generation of cargo ships.

Jennifer performed construction stage analysis in Midas Civil and worked with the contractor JV to coordinate construction stage loading and erection sequencing.

#### **California High-Speed Train, Fresno to Bakersfield, CA**

Graduate Bridge Engineer for the preliminary (15% and 30%) design of a 110-mile-long high-speed rail corridor between Fresno and north of Bakersfield. Responsible for structural design of 10 High Speed Train viaducts (34 miles total length of bridge), 30 roadway crossings, wildlife crossings, stations and maintenance facilities.

Jennifer developed structural concepts and produced drawings for viaducts over UPRR and BNSF tracks, state highways and local streets. Designed 350-foot span steel truss bridges for High-Speed Train over crucial highways and studied train-structure interaction effect on rail elements and abutments.

#### **Crenshaw/LAX Transit Corridor, Los Angeles, CA**

Structural Engineer for the \$1.3bn design-build project for the Metro Crenshaw/LAX line which extends from the existing Metro Exposition line at Crenshaw and Exposition Boulevards. The line will travel 8.5 miles to the Metro Green Line. Arup's scope includes the detailed design of three underground stations, 6,200 feet of single track / twin bore tunnels, seven cross passages and 9,600 feet of cut-and-cover tunnels.

Jennifer completed the structural design of the cut and cover light rail tunnel included structural analysis and detailed design considering high seismic loads and aircraft collision loads. She led the construction support for the UG1 Tunnel for over a year until the completion of the project.



# JOHN R. GIBBS

ASLA, LEED AP  
PRINCIPAL | LANDSCAPE ARCHITECT + PLANNER



**PROJECT ROLE:** PRINCIPAL-IN-CHARGE (PIC), ENGAGEMENT LEAD, ADAPTATION STRATEGY

## PROJECT EXPERIENCE

Project Award +

Sausalito Sea Level Rise Adaptation Plan  
Sausalito, CA

Bothin Marsh  
Adaptation + Resiliency Project  
Marin County, CA

TAM Sea Level Rise Adaptation Study  
Marin County, CA

Miller Avenue Streetscape Design +  
Implementation  
Mill Valley, CA

North Basin Shoreline Adaptation and  
Park Conceptual Design  
Berkeley, CA

San Francisco Bay Trail Risk Assessment and  
Adaptation Prioritization Plan (RAAPP)\*  
San Francisco, CA

Richardson Bay Resilience Project  
Marin County, CA

Bay Area Resiliency Hot Spots  
San Francisco, CA

Strawberry Vision Plan  
Marin County, CA

MTC Priority Conservation Areas Refresh  
San Francisco, CA

San Geronimo Vision Plan  
Marin County, CA

Cleveland Harbor Eastern Embayment  
Resilience Study (CHEERS)  
Cleveland, OH

Sir Francis Drake Boulevard Complete Streets  
Marin County, CA

Estuary Park  
Oakland, CA

Mill Valley General Plan  
Mill Valley, CA

Tunitas Creek Beach Improvements  
San Mateo County, CA

John shares WRT's deep commitment to environmentally rooted planning and design excellence. His work reflects his belief that open space infrastructure—whether at the scale of regional park systems, riverfronts, city parks, livable streets, or active plazas—is a crucial, integral part of creating quality urban environments. He is a practice leader in WRT's Parks & Open Space and Community Design practices, where he advances community and ecological resiliency in all WRT projects. Community engagement is fundamental to all facets of his work and his outreach skills are valued by clients who seek positive outcomes rooted in productive public dialogue. John's recent work builds on WRT's core practice areas and mission to address climate resiliency and social equity. He is leading coastal adaptation work to prepare communities for sea level rise through productive community dialogue and place-based adaptation responses.

## EDUCATION

University of California, Berkeley, *Master of Landscape Architecture*

University of California, Davis, *Bachelor of Landscape Architecture*

## AFFILIATIONS + AWARDS

CA Landscape Architect #4417

American Society of Landscape Architects (ASLA)

**Bothin Marsh Adaptation + Resiliency Project**, Evolving Shorelines award from CA State Parks Trails & Greenways, 2024

**San Lorenzo Creekway Master Plan**, California Trails & Greenways Foundation, 2023

**San Francisco Bay Trail Risk Assessment and Adaptation Prioritization Plan (RAAPP)**, Award of Excellence - Innovation in Green Community Planning, Northern California Section CA APA, 2022 // Merit Award - Planning, California Trails & Greenways Foundation, 2021

**Miller Avenue Streetscape**, Honor Award for Design, Northern California Chapter, ASLA, 2019

## ENGAGEMENT

Making Old Parks New in Fresno - CPRS 2025

Deep East Rising - CA Adaptation Forum 2024

Adaptation of Frontline Coastal Trails in the Climate Battle - California Trails & Greenways Conference, 2024

Partnerships, Funding & Design: Adaptation at Bothin Marsh - California Trails & Greenways Conference, 2024



## Bothin Marsh Adaptation + Resiliency Project

Location	Role
Marin County, CA	Principal-In-Charge

Through the Bothin Marsh Adaptation Project, WRT and team are developing conceptual designs to adapt the Preserve to changing climate and SLR through nature-based strategies allowing for the evolution and restoration of tidal wetlands, and restoration of ecological processes and habitat function at Bothin Marsh. The Preserve's trail system will also be adapted to ensure year-round active transportation and recreational access along the shoreline. Through extensive community engagement and support from a broad team of science and technical advisors, the project supports the community's vision for the shoreline and the broader San Francisco Baylands Ecosystem Habitat Goals for the region.



## Estuary Park + Oakland Bay Trail Gap Closure

Location	Role
Oakland, CA	Principal-In-Charge

WRT assisted the City of Oakland with the transformation of critical segments of the Oakland Waterfront Trails as part of the larger Bay Trail Network, and led a team to develop the Master Plan for the reimagined and expanded 11-acre Estuary Park, which provides a vision to expand recreational amenities for a diverse community, improve access to, enjoyment of, and the health and functionality of the shoreline, and improve the San Francisco Bay Trail through the park. We developed implementable improvements that will address a host of technical challenges including shoreline protection and enhancement and sea-level-rise resiliency and adaptation.



## Bay Trail Needs, Operations, and Maintenance Assessment

Location	Role
Bay Area, CA	Principal-In-Charge

WRT, in collaboration with the Metropolitan Transportation Commission, is leading a region-wide assessment to improve the 350-mile San Francisco Bay Trail's functionality, equity, and sustainability. Field surveys, stakeholder input, and cultural asset mapping were combined and used to identify priority needs like access gaps, amenities, habitat restoration, and flood resiliency. The plan includes a comprehensive geospatial database, walk/bike access analysis for Equity Priority Communities, and a review of operations and maintenance practices. The final framework will provide actionable strategies and tools to guide trail improvements, support equitable access, and ensure long-term stewardship.



## TAM Sea Level Rise Adaptation Study

Location	Role
Marin County, CA	Principal-In-Charge (WRT Team Only)

WRT is a member of the Arup team that is leading this comprehensive sea level rise adaptation planning project. The study looks to examine threats that affect road, freeway, rail, bicycle, and pedestrian transportation infrastructure, as well as adjacent civic infrastructure, such as water treatment facilities and airports. The project team has developed a methodology to identify and map communities and multimodal transportation infrastructure assets that are vulnerable to sea level rise, rising groundwater, and coastal flood hazards. The team conducted a sea level rise and coastal flood vulnerability and risk assessment of the entire Marin County Transportation system to identify hotspots for flood likelihood and consequence. In response, the team is developing nature-based adaptation solutions and creating a multi-phased implementation plan.





# CRISTINA BEJARANO

ASLA, AICP, LEED AP  
SENIOR ASSOCIATE | LANDSCAPE PLANNER



**PROJECT ROLE:** PROJECT MANAGER + SENIOR ADAPTATION PLANNER

## PROJECT EXPERIENCE

Project Award \*

Sausalito Sea Level Rise Adaptation Plan  
Sausalito, CA

Bothin Marsh  
Adaptation + Resiliency Project  
Marin County, CA

TAM Sea Level Rise Adaptation Plan  
Marin County, CA

North Basin Shoreline Adaptation and  
Park Conceptual Design  
Berkeley, CA

San Francisco Bay Trail Risk Assessment and  
Adaptation Prioritization Plan (RAAPP)\*  
San Francisco, CA

Richardson Bay Resiliency Project  
Marin County, CA

Bay Area Resiliency Hot Spots  
San Francisco, CA

Cleveland Harbor Eastern Embayment  
Resiliency Study (CHEERS)  
Cleveland, OH

MTC Priority Conservation Areas Refresh  
San Francisco, CA

San Lorenzo Creekway &  
Foothill Trail Master Plan  
Alameda County, CA

Willits Rail Trail  
Willits, CA

East Palo Alto Parks Master Plan  
East Palo Alto, CA

Point Molate Vision  
Richmond, CA

Ashland Common  
Hayward, CA

*Resilient South City, Resilient by Design  
Adaptation Planning + Design \**  
South San Francisco, CA

*\* Work done prior to joining WRT.*

Cristina Bejarano leads WRT's resilience and adaptation planning practice. She is a certified planner with 18 years of cumulative experience in landscape architecture, architecture, urban design, and environmental planning. She has worked at a wide-range of scales from environmental and campus master planning, to place-making and architectural design. Each project contributes to the overarching goal of promoting sustainable development through the design of active neighborhoods and vibrant ecological systems rooted in social equity and climate resiliency.

## EDUCATION

University of California Berkeley, *Master of City Planning*

University of California Berkeley, *Master of Landscape Architecture & Environmental Planning*

Washington University in St. Louis, *Bachelor of Art in Architecture + Minor in Anthropology*

## AFFILIATIONS + AWARDS

American Institute of Certified Planners

American Society of Landscape Architects, Associate

U.S. Green Building Council (USGBC) LEED Accredited Professional

**Bothin Marsh Adaptation + Resiliency Project**, Evolving Shorelines award from CA State Parks Trails & Greenways, 2024

**San Francisco Bay Trail Risk Assessment and Adaptation Prioritization Plan (RAAPP)**, Award of Excellence - Innovation in Green Community Planning, Northern California Section CA APA, 2022 // Merit Award - Planning, California Trails & Greenways Foundation, 2021

**San Lorenzo Creekway Master Plan**, Merit Award from CA Trails and Greenways 2023, APA North California, Award for Planning Excellence 2025

## ENGAGEMENT

Adaptation of Frontline Coastal Trails in the Climate Battle,  
CA Trails and Greenways Conference, 2024

Innovations in Local and Regional Adaptation: Success Stories from State funded Climate Adaptation Planning Projects - California Adaptation Forum, 2023

UC Berkeley, LA 12 Environmental Science for Sustainable Development Lecturer, 2023

UC Berkeley, Landscape Architecture and Environmental Planning Reviewer, 2019

UC Berkeley, "Urban Design in a Time of Climate Change" Studio Lecturer, 2018

SPUR, Public Programming Committee, 2019

## Bothin Marsh Adaptation + Resiliency Project

Location	Role
Marin County, CA	Project Manager

Through the Bothin Marsh Adaptation Project, WRT and team are developing conceptual designs to adapt the Preserve to changing climate and SLR through nature-based strategies allowing for the evolution and restoration of tidal wetlands, and restoration of ecological processes and habitat function at Bothin Marsh. The Preserve's trail system will also be adapted to ensure year-round active transportation and recreational access along the shoreline. Through extensive community engagement and support from a broad team of science and technical advisors, the project supports the community's vision for the shoreline and the broader San Francisco Baylands Ecosystem Habitat Goals for the region.



## Bay Trail Needs, Operations, and Maintenance Assessment

Location	Role
Bay Area, CA	Project Manager

WRT, in collaboration with the Metropolitan Transportation Commission, is leading a region-wide assessment to improve the 350-mile San Francisco Bay Trail's functionality, equity, and sustainability. Field surveys, stakeholder input, and cultural asset mapping were combined and used to identify priority needs like access gaps, amenities, habitat restoration, and flood resilience. The plan includes a comprehensive geospatial database, walk/bike access analysis for Equity Priority Communities, and a review of operations and maintenance practices. The final framework will provide actionable strategies and tools to guide trail improvements, support equitable access, and ensure long-term stewardship.



## San Francisco Bay Trail RAAPP

Location	Role
Bay Area, CA	Adaptation Planner

WRT led a multidisciplinary team to create the San Francisco Bay Trail Risk Assessment and Adaptation Prioritization Plan (RAAPP) for the East Bay Regional Park District. The plan evaluates shoreline vulnerabilities and guides the prioritization of nature-based adaptation projects that balance ecological restoration, recreation, mobility, and educational goals. It includes example projects showing the latest adaptation techniques related to coarse beach and marsh adaptation, to demonstrate how shoreline access can evolve with rising sea levels. Developed with input from experts and community stakeholders, the plan offers an integrated, long-term approach to adaptation planning and design.



## TAM Sea Level Rise Adaptation Study

Location	Role
Marin County, CA	Project Manager (WRT Team Only)

WRT is a member of the Arup team that is leading this comprehensive sea level rise adaptation planning project. The study looks to examine threats that affect road, freeway, rail, bicycle, and pedestrian transportation infrastructure, as well as adjacent civic infrastructure, such as water treatment facilities and airports. The project team has developed a methodology to identify and map communities and multimodal transportation infrastructure assets that are vulnerable to sea level rise, rising groundwater, and coastal flood hazards. The team conducted a sea level rise and coastal flood vulnerability and risk assessment of the entire Marin County Transportation system to identify hotspots for flood likelihood and consequence. In response, the team is developing nature-based adaptation solutions and creating a multi-phased implementation plan.





# Katie DeLeuw

## Senior Director



Katie DeLeuw (she/her) is a South San Francisco resident who specializes in community engagement for transportation, environmental, and community planning. Her wide-ranging project experience includes engaging communities on climate adaptation, parks and land use, planning for future housing needs, stormwater and wastewater infrastructure, transit planning and station access, transportation plans, trails, and active transportation improvements. She is a collaborative leader and community engagement strategist with nearly 20 years of experience managing and implementing stakeholder and public participation plans. She is passionate about connecting people to issues that affect them and supporting agencies in making decisions that center the needs of communities, guiding successful communication and outreach processes through all project phases – from conceptual planning and environmental review through design and construction.

## Relevant Experience

### **Beach Boulevard Infrastructure Resiliency Project —City of Pacifica** **Engagement Lead | 2022 to 2023**

Through the Beach Boulevard Infrastructure Resiliency Project, the City of Pacifica is replacing the current seawall and outdated infrastructure while building climate resilience into the most vulnerable segment of the City of Pacifica's shoreline. Katie led engagement for the project through developing an engagement strategy and implementation plan, developing clear messaging in response to community questions and concerns, and managing implementation of multiple community meetings. Impacts of methods for addressing the infrastructure vulnerabilities, combined with sea-level rise and coastal flooding due to storm surges, contributed to community members' concerns and the potential for controversial public meetings. Katie worked closely with the technical team to understand and communicate data from technical studies and best available science, while listening to and validating concerns from impacted community members, resulting in highly-attended and successful engagement with communities.

### **Marin County Community Development Agency —Stinson Beach Adaptation and Resiliency** **Collaboration (ARC)**

#### **Project Manager | 2022 to 2023**

With sea level rise a real and growing threat to coastal communities across the state, Marin County is exploring a range of potential solutions and adaption pathways to reduce risks posed by sea-level rise and coastal hazards in the short, medium, and long term. Katie supported the County in engaging with local and regional communities on this important topic through preparing accessible communication materials, implementing pop-up meetings for beach visitors, and facilitating virtual community meetings.



Resume - Katie DeLeuw

### **City of Sunnyvale – East Channel Trail Study**

#### **Engagement Director | 2024 to Present**

The City of Sunnyvale is conducting a multi-year study of a six-mile, shared-use trail for walking and biking along the East Channel, spanning from the San Francisco Bay Trail in the north to Homestead Road in the south. Katie oversees the Winter team in implementing community engagement, including developing a comprehensive Community Engagement Plan, convening and facilitating a group of Trail Ambassadors who live along the East Channel, and planning and implementing methods such as pop-up events, interactive community meetings, and walking workshops along the future trail route.

### **City of Burlingame – Vision Zero Action Plan**

#### **Engagement Lead | 2024 to Present**

The City of Burlingame Vision Zero Action Plan is an important milestone in the City's commitment to safer streets for everyone. As the City works toward achieving Vision Zero, Katie is leading the Winter team in supporting community engagement efforts, including a developing a digital project microsite that includes a map-based interactive survey, convening and facilitating a Community Advisory Council, organizing and hosting pop-up outreach events at the Burlingame Farmers Market and a schools, and organizing walk audits to assess specific transportation challenges in the city.

### **Alameda County Transportation Commission - East Bay Greenway Multimodal Corridor Project**

#### **Engagement Director | 2024 to Present**

Alameda County Transportation Commission (Alameda CTC) and the City of Hayward are planning the East Bay Greenway Multimodal Project (EBGWM), to link BART stations from Lake Merritt BART to South Hayward BART with bicycle and pedestrian infrastructure. Katie is advising and supporting the Winter team on community engagement which focuses on connecting with and getting input from local interested parties, through varied activities ranging from an Active Transportation Working Group, survey, focus groups, pop-ups, and mailers to residents near the proposed corridor route.

### **City of South San Francisco —Active Transportation Plan Update**

#### **Project Manager and Community Outreach Lead | 2018 to 2020**

Katie worked with the City of South Francisco to develop and implement an inclusive strategy to engage residents in conversations about the benefits —and challenges —of walking and biking locally. Katie strategized on and supported outreach, such as community pop-up events, collaborating with the Bicycle and Pedestrian Advisory Committee business community meetings, tabling at the BART station, and gathering input through “transportation trivia” at a local brewery.

### **Caltrain —Caltrain Business Plan**

#### **Project Manager and Stakeholder Engagement | 2018 to 2020**

Katie's background includes stakeholder engagement and strategic communication efforts for Caltrain's Business Plan, a vision and equity framework for the future of rail service for the next two decades in coordination with future blended service with California High Speed Rail. Katie strategized on public communication documents such as frequently asked questions, factsheets, and web content. Supporting stakeholder engagement, Katie led a team to track input from local elected officials through a local policymaker committee and coordinating a stakeholder advisory committee.

# Frank J. Ponciano

## Director



**Frank Ponciano (he/him)** has since been dedicated to educating and engaging Bay Area communities of color on quality of life policy issues and projects since 2015. He transitioned from the advertising and media industry to community organizing with the goal of bringing justice and equity to marginalized communities. As a policy specialist for a San José Councilmember, Frank became an expert in housing and homelessness, public safety, and environmental policy. He realized the importance of transportation as a crucial intersectional issue and how it can drive progress in communities. Frank brings his passion about equity in public participation to his work at Winter, where he contributes with his extensive community engagement experience and wide network of Bay Area relationships.

## Project Experience

### **City of San José – Guadalupe River Trail**

#### **Engagement Manager | 2024 – Present**

Frank leads outreach planning and implementation on behalf of the City of San José, engaging communities along the Guadalupe River Trail to discuss flood mitigation and identify safe alternative routes for bicyclists and pedestrians. His role involves organizing pop-ups at key trail locations to directly reach users, as well as coordinating community workshops that allow the project team to present plans and gather valuable feedback.

### **San Francisco Bay Area Rapid Transit – Sustainability Action Plan**

#### **Engagement Facilitator | 2024 – Present**

Frank facilitates publicly accessible webinars, guiding discussions and ensuring active engagement from participants. He provides strategic feedback on the development of webinar materials and agenda planning, aiming to optimize content clarity, accessibility, and effective audience participation. His input helps streamline data collection processes, making sure information gathered is actionable, precise, and relevant to project goals.

### **Alameda-Oakland Bicycle-Pedestrian Bridge**

#### **Engagement Lead | 2023 – 2024**

The cities of Oakland and Alameda are in the early stages of planning an iconic bridge that will connect the two communities across the Oakland Estuary. As Engagement Lead, Frank implemented a stakeholder advisory committee and an equity advisory committee composed of CBOs and other key stakeholders in the communities in and around the project study area. Frank played a lead role in developing a strategy for project branding, messaging, and general engagement approach while helping the client navigate a complicated multi-agency jurisdictional landscape on a project with significant environmental





Resume – Frank Ponciano

considerations.

**San Joaquins Joint Powers Authority – Antioch Station Working Group**

**Meeting Facilitator and Group Mediator | 2025 – present**

Frank facilitates and mediates meetings among agency representatives involved in decision-making about the future of the Amtrak San Joaquins Antioch Station. In this role, he coordinates communication across multiple agencies, develops structured meeting agendas, keeps discussions focused and productive, ensures timely progression of dialogue, and aligns all participants around shared objectives and clear next steps.

**Metropolitan Transportation Commission – Next Generation Freeway Study**

**Project Manager and Engagement Lead | 2023 – 2024**

Frank led Winter's role in the MTC Next Gen Freeway Study strategizing on focus group recruitment and outreach and facilitating focus groups, through which participants representing a wide range of demographics provided feedback on future potential freeway tolling scenarios in the Bay Area. Frank led the Winter team to strategize on focus group format and discussion prompts, analyze participant feedback, and develop a written report and visual presentation of results.

**City of San José – COVID-19 Recovery Task Force and Lived Experience Group**

**Facilitator and Community Relationship Manager | 2022**

Frank secured private funding from the Silicon Valley Community Foundation to complement public funds and carry out a community engagement strategy featuring the Lived Experience Group, a team of diverse San José residents impacted by COVID-19. The group facilitated over 30 community engagement events, showcasing Frank's ability to connect with a broad range of community members and deepen the City of San José's ability to receive authentic insights from local communities.

**City of San José - Delivering Zero Emissions Communities**

**Facilitator and Engagement Lead | 2021 – 2023**

Delivering Zero Emissions Communities is an accelerator program organized by the Natural Resources Defense Council (NRDC) to help cities across the country to take bold action on climate change with the goal of moving toward 100 percent zero emissions commercial vehicles by 2030. Frank facilitated an Equity Task Force to take part in the creation of innovative solutions to reduce greenhouse gas emissions by freight and commercial vehicles.

**City of San José - Climate Smart Building Electrification Plan**

**Facilitator and Engagement Support | 2021**

Frank led the facilitation of a series of community meetings where the City of San José presented its draft building electrification plan to community leaders. Frank planned these forums and reached out to interested community members as potential partners for further outreach. As part of the Winter team, Frank was involved in successfully mediated conversation between grassroots leaders and San José City staff, connecting with over 30 community leaders in the tenant, landlord, and labor communities, and developing a community engagement report compiling learnings and corresponding analysis.



## Daniel Jacobson, AICP

### Principal

#### About

Daniel Jacobson is a Principal focusing on transportation strategy, policy, operations, and design projects. Daniel focuses on complex transit, complete streets, and development projects, drawing upon a range of experiences helping public and private sector clients. He excels at helping clients resolve challenges at all stages of project development. Daniel brings a passionate, problem-solving approach to transportation projects to achieve meaningful, implementable outcomes.

#### Education

BA, with Honors, Urban Studies,  
Stanford University

#### Certifications

Certified Planner (AICP), American  
Planning Association

#### Expertise

Complete Streets Planning and  
Design

Bus and Rail Service Planning

Travel Markets Analysis

Traffic Operations and Forecasting

#### Relevant Project Experience

##### East of 101 Area Complete Streets Studies (South San Francisco, CA)

As principal-in-charge, Daniel oversaw the preparation of complete streets layouts for the East of 101 Area in South San Francisco. These studies covered over a dozen key corridors to advance the implementation of active transportation and transit improvements while optimizing traffic operations within a fast-changing district. Fehr & Peers prepared detailed conceptual designs for each corridor, coordinated the development of cost estimates, and prioritized recommendations into two tiers to help guide the city's implementation efforts.

##### South San Francisco General Plan (South San Francisco, CA, 2019-2022)

Daniel led the transportation analysis for South San Francisco's General Plan Update. The General Plan Update identifies how the City will continue to grow its housing and employment over the next two decades. For the mobility element, key areas of focus included developing a citywide subarea model, identifying new infrastructure and services to support land use growth, right-sizing parking requirements, updating the City's transportation demand management ordinance, developing a trip cap for its East of 101 employment hub, and analyzing the effects of land use and transportation changes for CEQA.

##### Southline Specific Plan EIR (South San Francisco, CA, 2020-2022)

Daniel led the transportation analysis for the Southline Specific Plan EIR in South San Francisco's Lindenville district. The project includes a 2.8 million square foot office/R&D campus, several new streets, and enhancements to bicycle/pedestrian connections to the San Bruno BART Station. The EIR included modeling and a Vissim simulation of proposed transportation and land use changes, with a particular focus on the interface between vehicles, buses, pedestrians, and bicyclists adjacent to the BART station. A traffic operations analysis was also prepared for informational purposes.

##### Lindenville Specific Plan (South San Francisco, CA, 2022-present)

Daniel led the transportation analysis for the Lindenville Specific Plan, a plan contemplating land use and transportation changes in South San Francisco. The Specific Plan includes an analysis of key transportation constraints and recommendations for multimodal improvements to support the area's changing land use conditions.

##### South City Shuttle Planning Study & Operator Procurement (City of South San Francisco, CA, 2022)

As project manager, Daniel led a planning study for the City of South San Francisco's South City Shuttle service. The study examined opportunities for service enhancements based on community input, ridership patterns, and recent development activity within the City.

Recommendations for incremental changes to the existing community shuttle route were developed alongside conceptual plans for a new route. In parallel, Daniel led the preparation of a Request for Proposals document to procure a new shuttle operator, focusing on improving data management and incorporating zero-emissions vehicle technology.

### Active South City Bicycle and Pedestrian Master Plan (South San Francisco, CA, 2018-2020)

Daniel supported the development of the Active South City Bicycle and Pedestrian Master Plan. Daniel supported an analysis of existing bicycle and pedestrian demand, including use of micromobility services and first/last mile travel to transit. Daniel contributed to the bicycle and pedestrian network recommendations with a focus on the relationship to citywide changes in land use and transportation conditions.

### Mobility 2020 East of 101 Plan (South San Francisco, CA, 2018-2019)

Daniel led a strategic plan for transportation improvements in the East of 101 Area in South San Francisco. The plan analyzed existing commute patterns using StreetLight LBS data as well as the potential transportation effects of projected land use changes in the East of 101 employment district. Through a stakeholder engagement process with local employers and partner agencies, the plan identified a set of infrastructure and service improvements to enhance person throughput and address underlying deficiencies in vehicle, transit, bike, and pedestrian systems.

### Genentech Master Plan EIR (South San Francisco, CA, 2016-2019)

Daniel led the transportation analysis for the Genentech Master Plan EIR, a long-term vision for doubling the size of the Genentech campus in South San Francisco. The transportation analysis was tailored to understanding unique conditions at the Genentech campus, including a highly successful TDM program, a changing mix of office and lab uses, and a constrained transportation system. The project included a trip cap in order to manage the growth of vehicle trips over time.

### WETA Business Plan (Bay Area, CA, 2022-2025)

As task lead, Daniel helped WETA prepare its first Business Plan and 2050 Service Vision to inform how the SF Bay Ferry service will evolve over the coming decades. The Business Plan includes an analysis of travel demand, emergency response capacity, environmental considerations, financial and organizational needs, and equity. A regional effort to engage the public and stakeholders informed the final service vision and recommended phasing.





## Taylor McAdam, AICP

### Associate

#### About

Taylor is an associate who is passionate about co-creating resilient, safe, equitable, and community-beloved public streets and transportation experiences. She specializes in managing transportation plans that link together multiple disciplines and a multitude of different community and agency partners. Anticipating the linkages of distinct analytical tasks and assembling a coherent story is a particular skill that sets her up to lead robust, community-engaged plans. Her roots in the Bay Area and 10 years of transportation planning experience allow her to take a high-level approach that considers regional context, as well as a detailed approach that reflects the unique aspects of each project and community.

#### Education

MA, City and Regional Planning,  
University of North Carolina, Chapel Hill

BA, Urban Studies, Stanford University

#### Certifications

Certified Planner (AICP), American Planning Association

#### Publications

Private Transit: Existing Services and Emerging Directions (2018), TCRP Research Report 196.

#### Expertise

Project Management

Stakeholder Management

Community Outreach and Engagement

Long Range Plans

Community-Based Plans

Equitable Planning

Public Meeting Facilitation and Presentation

Policy Framework Design

Transit Alternatives Analysis

Transportation Planning and Policy Education

#### Relevant Project Experience

##### South San Francisco General Plan Update (South San Francisco, CA)

Taylor served as project manager for the transportation elements of South San Francisco's General Plan update. Taylor led Fehr & Peers' work on existing conditions, VMT thresholds, transportation alternatives, and general plan policy development. Taylor provided regular presentation updates to the Citizen Advisory Committee and City Council. She also curated and facilitated a community workshop on transportation trends with guest speakers, a best practice showcase, and a Q&A session. This plan won the Northern California APA Award of Excellence for comprehensive plan for a small jurisdiction in 2023.

##### Lindenville Specific Plan (South San Francisco, CA)

Taylor managed the transportation analysis and mobility strategy development for the Lindenville Specific Plans. Lindenville has a highlight constrained and auto-centric roadway network that proved challenging to modify for the new mixed-use neighborhood vision. The Fehr & Peers team developed a layered network approach to maximize usage of narrow streets and designed key multimodal connections to outside neighborhoods like downtown South San Francisco, East of 101 and the San Bruno BART station.

##### SFMTA Waterfront Resiliency Transportation Assessment (San Francisco, CA)

SFMTA has engaged Fehr & Peers to help define and evaluate transportation alternatives that align with the Port's adaptation strategies to address seismic and sea-level rise hazards along its eastern waterfront. Taylor is managing a team of transportation modeling, visual communication, and engineering experts to frame an analysis methodology and evaluation criteria. She regularly facilitates meetings with the full consultant team, multiple SFMTA divisions, and the Port and their consultant teams. The results will need to be communicated to a range of stakeholder audiences.

##### Tanforan Mall Master Plan (San Bruno, CA)

Taylor's team completed transportation planning due diligence for the Tanforan Mall redevelopment. The Fehr & Peers team evaluated options for internal site circulation and circulation on the surrounding street network. The team considered all modes in their evaluation including existing City of San Bruno plans for protected bicycle facilities on Huntington Avenue and future developments along El Camino Real and Sneath Lane. The due diligence work prepared the development team with plans for parking, multimodal site circulation, and TDM.

##### PUC Project Due Diligence (South San Francisco, CA)

Taylor served as project manager for the due diligence work completed for the KASA/AGI Avant team developing a site proposal for the PUC site in South San Francisco. The due diligence work included trip generation estimates, site access review, participation at community outreach meetings, and development of a transportation demand management plan.

## TOD Pedestrian Access Plan (San Mateo, CA)

As community engagement lead, Taylor developed a community-driven outreach plan by interviewing key stakeholders in the senior, Latinx, and youth communities. These were community segments previously identified by the City of San Mateo as “hard-to-reach.” The stakeholder interviews revealed unique outreach methods to reach each community subset as well as a diversity of engagement methods ranging from an online scavenger hunt to in-person focus groups.

## Mobility 2020 East of 101 Plan (South San Francisco, CA)

Taylor served as a planner on a strategic plan for transportation improvements in the East of 101 Area in South San Francisco. The plan analyzed existing travel patterns using StreetLight data as well as the potential transportation effects of projected land use changes in the East of 101 employment district. Through a stakeholder engagement process with local employers and partner agencies, the plan identified a set of infrastructure and service improvements to enhance person throughput and address underlying deficiencies in vehicle, transit, bike, and pedestrian systems. Projects were prioritized into near- and long-term implementation lists and assigned scores for relative cost and implementation difficulty.

## Canal Community-Based Transportation Plan (CBTP) (San Rafael, CA)

MTC’s CBTPs take a grass-roots approach to addressing transportation issues facing low-income communities around the Bay Area. In her role as Project Manager, Taylor coordinated closely with the Canal Alliance, a local community-based organization, to engage residents in a space and language that is familiar and a format that is conducive to robust discussion. Taylor’s team distilled community feedback on issues, solutions, and priorities and developed an implementation strategy with funding suggestions and a selection of projects highlighted as quick-build for near-term implementation.

## Caltrain Business Plan (San Francisco Bay Area, CA)

Taylor led the Outreach and Equity elements of the Caltrain Business Plan. She led an assessment of equity outcomes of the long-range service vision and prepared policy and planning recommendations to advance equitable access to the system. Recommendations included items on fare structure, service schedules, station access, infrastructure placement, and the planning and engagement processes. As Outreach lead for the Business Plan, Taylor translated technical elements for public and stakeholder outreach. She also coordinated partner agency engagement with Caltrain staff and ensures that the Plan website is updated.



## ELLEN PLANE

### Coastal Scientist

### Role on Project – Project Manager

**Years of Experience**

8 years

**Years with SFEI**

5 years

**Education**

MLA, Environmental Planning, UC Berkeley

MCP, City & Regional Planning, UC Berkeley

BA, Ecology, Dartmouth College

Ellen Plane is a senior scientist in the San Francisco Estuary Institute's Resilient Landscapes Program, specializing in sea-level rise adaptation and tidal habitat restoration. She works on landscape planning efforts aiming to enhance shoreline resilience using nature-based solutions. Ellen specializes in groundwater rise and has been a leader in expanding knowledge about this emerging climate hazard in the San Francisco Bay Area. At SFEI, she has collaborated with wastewater dischargers to develop multi-benefit nutrient removal and shoreline adaptation strategies. Ellen also leads SFEI's work on the Baylands Resilience Framework, a suite of quantitative metrics to support adaptation and restoration planning across the region. Ellen brings expertise in coastal processes, wetland ecology, geospatial analysis, cartography, and graphic design to her work.

### Project experience

**San Francisco Bay Regional Water Quality Control Board, Adaptation Pathways: San Leandro Operational Landscape Unit, Oakland and Alameda, CA.** SFEI collaborated with the Oakland-Alameda Estuary Adaptation Committee (OAAC) to develop example adaptation pathways for the San Leandro Operational Landscape Unit (the Oakland-Alameda shoreline unit identified in SFEI's Adaptation Atlas). Ellen led the development of the report, which catalyzed planning efforts of the OAAC, which includes local governments, community based organizations, and regional agencies with an interest in adaptation planning along the Oakland-Alameda shoreline. The example adaptation pathways include triggers and thresholds for taking action and show how adaptation strategies can be woven together into a long-term plan for SLR adaptation that achieves multiple goals. Ellen was lead author of the report and continues to serve as scientific advisor to the Oakland Alameda Adaptation Committee.

**Bay Area Clean Water Agencies, Nature-based Solutions for Nutrient Removal, San Francisco Bay region, CA.** High nutrient concentrations can lead to algal blooms and low dissolved oxygen, which can harm aquatic ecosystems. After the severe 2022 harmful algal bloom in San Francisco Bay, regulators see the Bay's resilience to high nutrient loads decreasing and are urging proactive nitrogen management. SFEI and BACWA explored how nature-based solutions like open water wetlands and horizontal levees could be used to reduce nutrient discharge from wastewater treatment plants and support wildlife habitat, flood risk management, and recreation. SFEI created a GIS model to identify potential locations for nature-based treatment solutions, then collaborated with staff at individual treatment plants where promising opportunities were identified to create site-specific alternatives. In the final stage, the project team worked with engineering consultants to develop preliminary designs and cost estimates to facilitate implementation. Ellen served as science lead for the effort.



**Sonoma Land Trust, Petaluma River Baylands Strategy, Petaluma River, CA.** SFEI, together with Sonoma Land Trust, Sonoma Resource Conservation District, Point Blue Conservation Science, and Ducks Unlimited, developed the Petaluma River Baylands Strategy to guide future restoration efforts. Historically, this area hosted a diverse landscape of tidal habitats, including marshes, mudflats, and open water, and some intact tidal marshes are still present today. However, much of the landscape has been diked and drained for agriculture and urban development. Now, climate change and rising sea levels pose significant challenges. The Strategy outlines a restored landscape vision and potential alternative scenarios, created with input from scientific advisors, local community members, Tribes, and agencies. Ellen was lead author of the report.

**US Army Corps of Engineers, Regional Analysis of Potential Beneficial Use Locations, San Francisco Bay, CA.** SFEI and partners are engaged in a long-term effort to define and quantify baylands resilience for San Francisco Bay through the Baylands Resilience Framework. In developing this framework, we ask: How can baylands resilience be measured? How can it be increased? The US Army Corps of Engineers San Francisco District is interested in how the answers to those questions might inform their decision-making about beneficial use of dredged material removed from navigation channels. SFEI supported the development of the San Francisco Bay Regional Dredged Material Management Plan by providing quantitative data that allows comparison of tradeoffs and benefits between potential dredged material placement sites. These sites include existing marshes as well as future restoration sites in diked baylands. The metrics can help provide quantitative justification for federal cost-share and help prioritize sites for future beneficial use pilot projects. This is part of USACE's intent to increase the beneficial use of dredged materials significantly in the near future, given the critical connection to ecosystem services including wildlife support and flood attenuation. In the future, the metrics developed for this study can be re-analyzed to track how beneficial use projects have changed baylands resilience to sea-level rise. Ellen is lead scientist for the Baylands Resilience Framework and was lead author of this report.

**State Coastal Conservancy, Sunset Natural Resilience Project, Ocean Beach, San Francisco, CA.** As part of the Sunset Natural Resilience Project, SFEI developed *Growing Resilience: Recommendations for Dune Management at North Ocean Beach*, a report addressing escalating dune erosion caused by informal trails, vegetation loss, and blowouts that lead to hazardous sand accumulation on the Great Highway and increased maintenance demands. The report outlines a suite of dune management strategies aimed at reducing sand deposition on infrastructure, lowering maintenance costs, enhancing native dune habitat, improving recreational access, and building long-term resilience to sea-level rise and coastal erosion. Ellen served as the lead author, integrating scientific analysis and stakeholder input into clear, actionable recommendations.



## JEREMY LOWE

Coastal Scientist

Role on Project – Technical Adviser

**Years of Experience**

38 years

**Years with SFEI**

10 years

**Education**

BA, Geography, University of Hull

Jeremy Lowe has been a senior scientist and coastal geomorphologist at SFEI since 2015. He has more than 35 years of experience in tidal wetland restoration and sea-level rise adaptation planning on the Pacific West Coast and in Europe. Since 2000, Jeremy has been working on nature-based climate change adaptation in San Francisco Bay and Southern California, including advising on project planning and design with numerous local, regional, and state agencies. He has worked with San Mateo County's Office of Sustainability SeaChange project, with the County of Marin's BayWave project, and on the HASPA Shoreline Adaptation Master Plan to develop science-based approaches to assess the feasibility of natural and nature-based climate adaptation strategies. For MTC, he has led working groups providing scientific input to engineering design alternatives for adapting Highway 37 to sea-level rise.

### Project experience

**Metropolitan Transportation Commission, Resilient SR 37 Advising, San Pablo Bay, CA.** State Route 37 faces significant risk from near-term flooding and long-term sea level rise. Additionally, the corridor experiences severe traffic congestion and presently creates a barrier to restoration and habitat connectivity. SFEI provides critical science support to MTC and its consultants in the design of State Route 37, ensuring the project integrates transportation planning with marsh restoration in the San Pablo Baylands. This includes compiling and organizing relevant environmental data, presenting landscape context and ecological constraints at meetings and site visits, and conducting targeted analyses to inform design decisions. SFEI also reviews and comments on conceptual designs to ensure they align with restoration goals. Jeremy leads SFEI's contributions, coordinating with the project team, guiding technical input, and serving as the primary point of contact.

**San Francisco Bay Regional Water Quality Control Board, San Francisco Bay Adaptation Atlas.** The Adaptation Atlas is a science-based framework for developing climate adaptation strategies that are appropriate to the diverse shoreline settings and that take advantage of natural processes in the Bay. The report proposes Operational Landscape Units (OLU) for San Francisco Bay. The primary focus is natural and nature-based approaches that can be used to create a resilient shoreline with multiple benefits. The report describes the environmental setting of the bay and divides it into physical units or OLUs. Nature-based adaptation strategies are described, and these strategies are mapped in appropriate locations in each OLU. Jeremy was a lead author of the report.

**Sonoma Land Trust, Sonoma Creek Baylands Strategy.** The Sonoma Creek Baylands Strategy is a comprehensive high-level plan for landscape-scale restoration, flood protection, and public access in the tidal Lower Sonoma Creek portion of the San Pablo Baylands. The Strategy: (1) coordinates the protection, acquisition, restoration, and enhancement of diverse baylands habitats; (2) integrates natural processes to increase climate resilience; (3) identifies opportunities for public access; and (4) provides recommendations for adjacent transportation corridors. SFEI worked with Sonoma Land Trust (SLT) and other project partners to analyze existing site conditions, develop restoration alternatives, evaluate geomorphic and habitat evolution, and assess the feasibility and cost of alternatives. Jeremy led the development of the Strategy and coordinated the project team and advisors.

**Valley Water and Google, Sunnyvale Shoreline Resilience Vision, Sunnyvale, CA.** SFEI facilitated the Sunnyvale Shoreline Resilience Vision, a collaborative effort between a group of organizations invested in long-term regional resilience and interested in coordinating across their individual planning efforts. Members of the group were landowners and land managers along the San Francisco Bay shoreline from Stevens Creek to San Tomas Aquino Creek, the “Sunnyvale Shoreline.” The group focused on adaptation efforts to address climate change risks. Topics explored include streamlining and improving the aging stormwater management system, enhancing ecological function and biodiversity in the urban area and the baylands, and developing a subregional shoreline adaptation approach to rising water levels. Jeremy served as project lead and lead facilitator.

**San Francisco Bay Shoreline Inventory.** To provide a comprehensive and consistent picture of today’s Bay shore, SFEI mapped and inventoried Bay shore features that could affect flooding and flood routing for all nine Bay Area counties. While many different detailed levee layers exist, the region currently lacks a standardized regional dataset of elevated Bay shore features, accredited or not. Mapping extends up to 10 feet above Mean Higher High Water and includes many shore features: engineered levees, berms, embankments, transportation structures, wetlands, natural shoreline, channel openings, and water control structures. Features were attributed with elevation, FEMA accreditation, how a structure was armored, whether a structure was fronted by a wetland or beach, ownership, and the entity responsible for maintenance, if known. The methodology was originally piloted in BCDC’s Adapting to Rising Tides (ART) project in Alameda and San Francisco counties and the mapping effort was funded by the San Francisco Estuary Partnership. Jeremy served as co-lead of the project.

**Baylands Ecosystem Habitat Goals Science Update.** The report is an update to the 1999 Baylands Ecosystem Habitat Goals, which for the first time set comprehensive restoration goals for the San Francisco Bay estuary. Produced by a collaborative of 21 management agencies working with a multidisciplinary team of over 100 scientists, the report synthesizes the latest science— particularly advances in the understanding of climate change and sediment supply—and incorporates projected changes through 2100 to generate new recommendations for achieving and sustaining healthy baylands ecosystems. Jeremy served as lead author of two chapters on habitat evolution and adaptation.



A rooftop garden with a city skyline in the background. In the foreground, there are two large, modern metal sculptures that look like wheels or rings. People are walking on the path, and a small dog is visible. The scene is framed by a dark, industrial-looking structure above, possibly a bridge or overpass.

# References

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## References

- Reference 1** Sea Level Rise Adaptation Planning for Marin County’s Transportation System, CA  
**Mikaela Hiatt**, Associate Transportation Planner  
 Transportation Authority of Marin  
 900 Fifth Avenue, Suite 100, San Rafael, CA  
**t:** 415-226-0830  
**e:** [mhiatt@tam.ca.gov](mailto:mhiatt@tam.ca.gov)
- Reference 2** San Francisco Bay Conservation & Development Commission (BCDC) Regional Adaptation Strategy Technical Assistance Program, CA  
**Dana Brechwald**, Assistant Planning Director for Climate Adaptation  
 San Francisco Bay Conservation & Development Commission,  
 375 Beale St, San Francisco, CA 94105  
**t:** 415-352-3656  
**e:** [dana.brechwald@bcdcc.ca.gov](mailto:dana.brechwald@bcdcc.ca.gov)
- Reference 3** Caltrans Climate Change and Vulnerability Risk Assessment Statewide Report  
**Julia Biggar**, Climate Change Branch Chief, Caltrans, Division of Transportation Planning | Office of Air Quality and Climate Change  
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An aerial photograph of a coastal highway. The road is a two-lane asphalt road that curves along the edge of a steep, green hillside. The hillside is covered in low-lying vegetation and has some rocky outcrops. The road leads down to a sandy beach and then follows the coastline, which is bordered by a deep blue ocean. In the distance, more hills and a small town are visible under a clear blue sky.

Completed  
reports and  
presentations

8



## Completed Reports and Presentations

### WRT Report/Presentation Samples



### Winter

- Burlingame Vision Zero Action Plan – Website collaboration with Fehr & Peers  
– <https://fp.mysocialpinpoint.com/burlingame-vzap>

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Links for additional outreach materials and reports including San Mateo Complete Streets Plan, SamTrans Central El Camino Real Multimodal Plan, Caltrans Highway 1 Climate Adaptation Planning, TAM SLR Adaptation Planning Study

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[Outreach Materials](#)

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[Reports](#)

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