ENVIRONMENTAL PROTECTION AGENCY (EPA)
2024 Clean Ports Program: Zero-Emission Technology Deployment Competition Notice of Funding Opportunity (NOFO)
EPA-R-OAR-CPP-24-04

I. Cover Page:

Project Title	San Francisco Waterfront Emissions-Free Ferry System
Applicant Information	Port of San Francisco
Type of Eligible Applicant	X Port authority __ State/ regional/ local agency with jurisdiction over a port authority or a port __ Tribal agency with jurisdiction over a port authority or a port __ Air pollution control agency __ Private entity meeting the requirements in Section III.A
Budget Summary	EPA Funding Requested: $55,386,000 | Applicant Costs: $15,537,000 | Total Project Cost: $70,923,000 Equipment and infrastructure costs are required to fully implement the project. The most scalable expense is the proposed subaward for workforce development.
Project Location(s)	**Name of Port(s) (or other project location and port(s) served):** ▪ San Francisco County (Port of San Francisco, Treasure Island) ▪ Alameda County (Oakland, Alameda) **Name of Port Authority, if applicable:** Port of San Francisco **County, City, State:** San Francisco, San Francisco, CA **Percent of time/activity in each county:** San Francisco County (Port of San Francisco, Treasure Island) 66%, Alameda County (Oakland, Alameda) 33%. X Small water port __ Dry port
Project Period	Project Start Date: Q4 – 2024 | Project End Date: Q1 - 2028
Short Project Description	The San Francisco Waterfront Emissions-Free Ferry System will allow for the operation of four zero emission (ZE) electric ferries serving three terminals located along the San Francisco waterfront and two terminals located in Alameda County. The System will include shore power charging systems to support rapid charging of the vessels at each of the three San Francisco terminals during passenger loading and unloading processes and sustain service during a typical operating day. Funding is included to support a regional maritime workforce development program that will train 200 participants in the marine trades and water transportation fields, including operating and maintaining ZE ferries and harbor craft. The ZE port equipment and infrastructure types included in the project include **1) Vessels and 2) Vessel shore power infrastructure.**
Other Potential Federal Funding Sources	N/A
Use of Logistics Software	Does the applicant use LOGINK or any other prohibited logistics platform as described in Section III.D. of the NOFO? __ Yes X No

II. Workplan:

Section 1 - Project Summary and Approach

a. Overall Project and Proposed Impact

The Port of San Francisco (the Port), in collaboration with the San Francisco Bay Water Emergency Transportation Authority (SF Bay Ferry or WETA), the San Francisco Public Utilities Commission (SFPUC), and the Working Waterfront Coalition (WWC), is requesting $55.4 million to fund the final, critical components needed to complete the San Francisco Waterfront Emissions-Free Ferry System: a zero-emission electric ferry servicing critical transportation hubs – the first of its kind in the United States.

Located along the eastern waterfront of San Francisco, the Port serves many of the City's densest residential communities and job centers. Unlike other ports that specialize in mostly cargo handling, the Port serves a diverse set of uses, including the handling of containerized and non-containerized cargo, cruise, tourism, leisure, and passenger transportation. Reducing emissions and environmental impacts at the Port is uniquely challenging and important because of these various uses, functions, and stakeholders. According to the latest San Francisco Climate Action Plan (2021), the transportation sector is responsible for 50% of emissions in San Francisco. This project presents a unique opportunity for the Port to effect transformative change, reduce emissions from the transportation sector, and improve the health of nearby communities by delivering a first-in-the-nation conversion of diesel ferry service to a high-speed ZE electric ferry service supporting critical transportation hubs around San Francisco Bay.

The San Francisco Waterfront Emissions-Free Ferry System (the project or the system) will allow for the operation of four ZE electric ferries serving three terminals located along the San Francisco waterfront as well as two terminals located in Alameda County. The system will include shore power charging systems at each terminal that facilitate rapid charging of the vessels during passenger loading and unloading processes.

This project has a strong foundation of initial investments in reducing emissions, secured through previous efforts by the project partners. These investments include passenger loading retrofits, which will accommodate the shore power charging systems, and three small ZE vessels to serve the waterfront on a limited basis. The Clean Ports grant program would provide the remaining $55.4 million necessary to fund the following components of the System:

- **Shore power charging systems** at the Downtown Ferry Terminal (DFT) and Mission Bay Ferry Landing (MBFL). These charging systems will provide sufficient capacity to rapidly charge the new, larger electric ferry, and will include major electrical components and equipment such as shore power and anchoring systems, switchgear, transformers, power converters, duct banks, electrical conduits, and feeders.
- **A fourth new ZE electric vessel**. With three small ZE electric vessels funded to date through the SF Bay Ferry partnership, the Port expects the first ZE electric vessel to be operating in limited revenue service in 2026. The fourth ZE electric vessel is necessary to complete the proposed service plan and replace emissions from larger existing vessels providing service to the Port. The fourth electric vessel would carry double the number of passengers and allow the service to grow and expand over time as well as carry passengers to more terminals to include not only San Francisco-bound passengers (Downtown, Mission Bay, Treasure Island) but also East Bay locations Oakland and Alameda. The larger capacity and expanded range will further reduce emissions through the system and lifetime of the vessel and allow for servicing more disadvantaged communities. Once delivered it will allow SF Bay Ferry to scrap an existing diesel vessel.

- **Workforce Development**. The requested grant funds for community partnerships would fund a ZE electric ferry workforce development and training initiative over a four-year period as the Port and SF Bay Ferry begin to deploy new ZE technologies in the ferry system. This program will be principally administered and managed by the Working Waterfront Coalition (WWC) and will provide training and skill development in the maritime industry with a specific focus on the new ZE technologies and equipment outlined in this grant request.

Successful Prior Deployments. The proposed ZE electric ferry system will be the first in the nation, and the Port and SF Bay Ferry are well positioned to deliver the project on time and successfully; both have an established track record of executing large, complicated, advanced technology projects. Both agencies have experience constructing State-of-the-Art ferry terminals within strict design standards meant to withstand major disasters and climate impacts: recent successful deployments and project delivery include the **$100 million Downtown San Francisco Ferry Terminal Expansion Project in 2020**. This project successfully deployed and integrated new regional fare collection equipment and security enhancements at each Downtown gate, successfully meeting the safety, performance, and durability expectations of the primary project stakeholders. SF Bay Ferry constructed a similar (not yet electrified) new **$20 million Richmond ferry terminal in 2019** that began operations supported by new high-speed ferries. The experienced team behind this will deliver the charging systems and vessel scoped in the San Francisco Waterfront Emissions-Free Ferry System. Additionally, the Port has completed the **$115 million James R. Herman Cruise Terminal in 2014**, which includes the state's first shore power system and now hosts over 100 cruise ship calls and more than 400,000 passengers every year and doubles as an indoor/outdoor event center on non-cruise days. Zero-emission ferries using the same design have been deployed extensively throughout Europe.

Domestic Sourcing. The project team has conducted extensive research and groundwork into compliance with Build America, Buy America for the project. It is confident about compliance and does not anticipate challenges in domestic sourcing; potential sourcing challenges are known and are eligible for coverage through existing program waivers. Although this emission-free system is new technology to the United States, it is proven abroad and ready for construction today: SF Bay Ferry, working with its marine engineering consulting team, has achieved a 90% design level for this new universal shore power delivery system that will be deployed at the Downtown San Francisco Ferry Terminal Gates E, F, and G for vessel charging. The project will create an estimated 300 direct jobs and 600 indirect jobs.

Working in Concert with Planned Future Assets and Supporting Investments. The San Francisco Waterfront Emissions-Free Ferry System is projected to carry approximately 1.3 million passengers per year beginning in FY 2028. All trips would be 100% zero emission. The replacement of a diesel vessel with the ZE electric vessel included with this project would reduce or avoid approximately 315,000 metric tons of Carbon Dioxide Equivalent (CO_2e) emissions over its anticipated useful life at the Port, benefiting the near-port, historically disadvantaged community of Bayview Hunters Point, as well as other disadvantaged communities in parts of Alameda County served by the project. Without full funding to deliver the system, SF Bay Ferry must either reduce frequency or use diesel vessels to provide its planned service to the Port of San Francisco. With the EPA Clean Ports grant, approximately 20% of total passenger ferry trips to and from the Port will be ZE by 2028. Installation of the shore power charging systems at the Port is a prerequisite to convert over 85% of total ferry trips to the Port to ZE by 2050, as other regional investments are made in ZE vessels, additional shore power charging systems, and systems management throughout San Francisco Bay.

b. Partnerships and Collaboration

Partnerships and collaboration are central to the delivery of the San Francisco Waterfront Emissions-Free Ferry System. In addition to dedicating its own staff and managing contracts and construction elements of the project, the Port is partnering with the SFPUC, SF Bay Ferry, and the Working Waterfront Coalition to deliver electrification infrastructure, shore power systems, vessels, and investments in workforce development. Upon grant award, the Port will enter formal memoranda of understanding with subaward recipients SF Bay Ferry and the SFPUC to clearly delineate project and financial responsibilities related to their subawards. SF Bay Ferry will contract with the Working Waterfront Coalition to deliver workforce benefits. Partnership responsibilities are described below.

Port of San Francisco. The Port oversees, manages, and holds 7.5 miles of waterfront lands, from Aquatic Park in Fisherman's Wharf to Heron's Head Park near India Basin, in public trust for the use and enjoyment of the people of California. The Port works to advance environmentally and financially sustainable maritime, recreational, and economic opportunities for the City, Bay Area, and California. The Port and other departments within the City and County of San Francisco have invested $29.4 million in early-phase project expenses for the Mission Bay Ferry Landing including design, permitting, and environmental mitigation.

San Francisco Public Utilities Commission (SFPUC). The SFPUC is a public utility enterprise that supplies water, sewer, and power to the City and County of San Francisco. The SFPUC is contributing $13.6 million in matching funds to the project to complete the upgrades needed to meet this project's charging needs by 2027. As detailed in the SFPUC's letter of commitment, these funds are part of a $31 million investment in the construction of a transmission level substation and associated power transmission and distribution facilities that will connect to key Port locations along the waterfront.

San Francisco Bay Ferry. The Port and SF Bay Ferry will rely on their established, long-term partnership and experience in large-scale project implementation to bring new, zero emission technology to the Downtown Waterfront through this project. SF Bay Ferry has committed $1.9 million in direct match for eligible expenses and $85.6 million in leveraged funding related to delivery of early phase and non-eligible project components, including three smaller vessels, a shore power system, and utility infrastructure. SF Bay Ferry will retain ownership of the vessel and equipment purchased under the grant.

Working Waterfront Coalition (WWC). The WWC is an industry-led regional maritime workforce development program that seeks to create a pipeline of ship maintenance and repair workers and vessel operators to address a serious shortage of regional workers capable of operating, maintaining, and expanding the maritime industry in the Bay Area including ferry service. The WWC's goal is to recruit and train a new generation of workers via innovative outreach to 18–24-year-old individuals from disadvantaged and low-income communities, as well as the re-entry population. The program features financial stipends for trainees, a full suite of wraparound services and first source hiring agreements with WWC members. Members of the WWC include maritime industry leaders, labor groups, local community-based organizations, educational institutions and county workforce development and probation departments. Under a contract with SF Bay Ferry, WWC will train over 200 apprentices and

expand collaboration with local community colleges and universities to adapt existing programs or develop new programs. This project will create an estimated 300 direct jobs and 600 indirect jobs.

c. Coordination with Complementary Initiatives

Delivery of the San Francisco Waterfront Emissions-Free Ferry System complements various other programs and initiatives to achieve the climate and transportation infrastructure goals of San Francisco, the Bay Area region, the State of California, and the Federal government. These include:

California Assembly Bill 617 (AB 617) implementation and the Bayview Hunters Point Community Emissions Reduction Plan (CERP). The Bay Area Air Quality Management District is currently partnering with the Bayview Hunters Point Community Advocates and the Marie Harrison Community Foundation to develop a CERP in the Bayview Hunters Point neighborhood, which is near the Mission Bay Ferry Landing, to identify strategies to reduce emissions in the area. These community groups have identified "port/maritime activities" as a major contributor of air pollutants in the area. This project supports the CERP by reducing vessel emissions in the Bayview Hunters Point neighborhood.

Metropolitan Transportation Commission Plan Bay Area 2050. Strategy 11b of the federally required Regional Transportation Plan (Plan Bay Area 2050) calls for transit electrification initiatives that reduce emissions and climate impacts. Achieving this Plan goal would be advanced by awarding funds from this project for the electrification of ferry service at the Downtown, Mission Bay, and Treasure Island ferry terminals – all projects included in the Plan.

San Francisco Bay Ferry 2050 Service Vision. The 2050 Service Vision outlines system electrification as a key priority for the next 25 years, including fully electric ferry service along the Port of San Francisco Waterfront. The Vision was developed through extensive stakeholder outreach and engagement, including targeted outreach to community-based organizations representing disadvantaged communities. **The award of subrecipient funding from this project to San Francisco Bay Ferry will advance the larger Vision of create a regional ZE ferry system**. That service vision relies on two important federal and state funding initiatives:

- **Federal Transit Administration (FTA) Ferry Boat Programs.** SF Bay Ferry has utilized competitive funding available to the FTA to plan for one of the three small electric vessels integral to this EPA proposed project serving Downtown SF, Mission Bay, and Treasure Island. Once the current proposed project is built and charging infrastructure is in place, SF Bay Ferry plans to utilize $53 million in FTA formula funding to replace its (at that point) last remaining two diesel vessels with large battery-electric vessels. FTA has also provided funding for electrification infrastructure at the Main Street and Downtown Terminal that will complement the proposed service in this application.
- **Transit and Intercity Rail Capital Program (TIRCP**). The TIRCP is a State of California initiative utilizing Cap and Trade sale proceeds to achieve transformative capital improvements that will significantly reduce emissions of greenhouse gases, vehicle miles traveled, and congestion. SF Bay Ferry has received over $38 million in funding through this program. Part of the funding will be used to build two of the three smaller ZE electric vessels that will serve Downtown, Mission Bay and Treasure Island. Additional TIRCP funding will retrofit the Treasure Island terminal with electric infrastructure and provide some of the funding needed to electrify Mission Bay and Downtown San Francisco. Funding was also recently awarded to provide electric infrastructure connections in Alameda to electrify the SF Bay Ferry's Main Street Terminal and Central Bay Maintenance Facility. The funding for electrification of the Maintenance Facility will ensure that the newly funded ZE

electric vessels have enough shore power at night and during maintenance activities and provide the opportunity for workforce development activities to occur at that facility on the new vessels.

San Francisco's Climate Action Plan 2021—TLU.3-5. Transportation and Land Use Strategy 3, supporting action #5, calls for the implementation of ferry service between Treasure Island and the Downtown San Francisco Ferry Terminal to help reduce congestion, reduce emissions, and create a more equitable transportation system that advances the use of low carbon modes especially in the Bay Bridge corridor. SF Bay Ferry has secured 100% of the capital dollars needed to complete a shore power charging system at Treasure Island for electric ferry service. An additional $1.7 million was recently secured in Lifeline Transportation Program (LTP) Cycle 4 operating funds from the San Francisco County Transportation Authority (SFCTA) for Treasure Island electric ferry operations in 2026. With the requested grant funding from EPA, the Port and SF Bay Ferry will be able to fully construct a shore power charging system at the Downtown San Francisco Ferry Terminal, which is a critical component in delivering ZE service on the Treasure Island route and making progress towards local emission reduction goals.

d. Project Risk Mitigation

The Port will ensure success of the project through close coordination with SF Bay Ferry to adequately analyze and prepare for project risks. The Port and SF Bay Ferry have demonstrated success in working together to deliver complex infrastructure projects. The Downtown San Francisco Ferry Terminal Expansion Project (project details below) was a similar scale and complexity compared to the proposed project. The project involved intensive above-water and in-water construction work in a busy urban waterfront. The ferry's team of managers, engineers, and contractors coordinated closely with the Port to manage project risks and successfully deliver the project. The Port would establish a similar project delivery arrangement for the San Francisco Waterfront Emissions-Free Ferry System and has completed a preliminary risk analysis to identify potential barriers to successful project implementation. Primary strategies for overcoming those barriers are outlined below:

Technical Risks (Low). SF Bay Ferry has contracted with a proven electrical systems integrator, Wartsila, who has delivered comparable all battery electric high speed aluminum catamaran ferries in Europe. Wartsila provides integration of all advanced technical components for the new ferry vessels and shore power systems. SF Bay Ferry is also contracting with multiple well known naval architecture design firms to complete the vessel design and integrate with the Wartsila systems. Additionally, the SF Bay Ferry team is contracting with several electrical and civil engineering firms with extensive experience in transit and transportation electrification.

Financial Risks (Moderate). Vessel, shore power, and infrastructure improvements will be completed under competitively bid commercial contracts and total cost will not be known until award and final acceptance. The marine repair and construction market has seen higher inflation rates than other industries and the technology being purchased, including large lithium-ion batteries and industrial-scale transformers which are subject to intensive price volatility. Pricing risks are tempered by the funding sources' low risk; matching non-federal funds are reliable and not subject to instability.

Security Risks (Low). Regarding physical security, ferry terminals are subject to US Coast Guard Security requirements. The terminal facilities are secured property and vessels exclusively operate at those secured terminals with monitored access and 24-7 surveillance. All onboard access points to vessel operating systems are physically locked when passengers are onboard. Cybersecurity threats are limited to access of vessel operating systems which are operating on a separate encrypted Wi-Fi data signal for shore monitoring. Software system architecture and security protocols are managed by our electrical systems integrator. System operating data access would have no impact on our operations should an

external threat gain access to our data systems. Internal threats from ferry operators or maintenance staff would be the largest vulnerability, however all such staff are vetted and monitored.

Organizational Risks (Low). The Project management team has extensive experience with marine systems delivery and complex capital infrastructure projects, with a long history of working together. The management team overhead is low with limited bureaucracy. Decision making is clearly delegated and does not require multiple level adjudication.

Execution Risks (Moderate). Current lead times for electrical components are rapidly changing in the rush to electrify multiple industries worldwide. Further, these projects push the boundaries of current regulatory and permitting related regulations which can induce schedule delays in system selection and permitting approvals. SF Bay Ferry is well underway with project designs, has identified regulatory pinch points, and is coordinating around potential issues. While capacity for local utilities and interconnection timelines for power distribution to terminal facilities poses some risk, the management team is engaged with utility providers to mitigate risks and meet implementation timelines.

e. Applicant Fleet and Infrastructure Description

Shore Power and Anchoring Systems at Mission Bay Ferry Landing (MBFL). The Project includes installation of a shore power and anchoring system as a component of MBFL. The MBFL is in the Mission Bay neighborhood near the intersection of Terry A. Francois Boulevard and 16th Street, adjacent to Agua Vista Park and near the planned Bayfront Park. The MBFL project involves the construction of a ferry terminal and equipment installation, including a floating shore power and anchoring system capable of mooring and charging ferry vessels. The MBFL project includes a fixed pier with canopy, a gangway, and shoreside public access and open space improvements. The project requires a terminal electrification plan that does not use traditional shore power pedestals but, instead, utilizes an equipment-based floating shore power and anchoring system. This system enables rapid ferry vessel charging during short turn-around stops while passenger load and unload the vessels. The shore power system will support 2MW rapid charging of electric ferries on both the port and starboard sides (4MW total), supplied via internally loaded power monitoring and conversion equipment coupled with 1350kWh of lithium-ion battery storage. The anticipated usage is 28 vessel landing and charging events per day with an average charge time of 8 minutes and a 160kWH power transfer at each event. Estimated total annual energy provided is 1,600MWh.

Downtown San Francisco Ferry Terminal (DFT) Electrification Project. The Project includes a request for funding towards behind the meter (BTM) electrical equipment and infrastructure to electrify the DFT. The Port, SF Bay Ferry, and SFPUC are working together to extend electrical infrastructure to the San Francisco Waterfront. This electrical grid extension and enhancement supports vessel charging for ferry routes serving the SF Bay Ferry's DFT. Charging at DFT will occur with three shore power systems at Gates E, F and G, like what will be installed at MBFL. These shore power systems at DFT are part of a separately funded project and will provide up to seventeen megawatts (17MW) of power including ten megawatts (10MW) of power from the electric grid and seven megawatts (7MW) of power from the battery energy storage systems installed in the floating shore power docks.

New ZE Electric Vessel. SF Bay Ferry is preparing to construct a fleet initially consisting of three 149-passenger ZE electric passenger ferries. Procurement of those vessels is expected by summer of 2024. Concurrent with that effort, SF Bay Ferry staff are developing plans and specifications for 400-passsenger vessels including the one proposed as part of this project. This 400-passenger ferry vessel will have a total battery capacity of 1,603kWh. Operating with this capacity will allow a range of 40-minute cross-bay transits. During normal operation, rapid vessel charging will take 5 to 8 minutes.

Opportunity charging will occur at terminals when unloading and loading passengers. This will allow continuous operation of the vessel throughout the day. The vessel will be newly constructed with a model year 2026. The vessels are designed to be fully accessible to passengers with disabilities in accordance with the Americans with Disability Act. The ferry will offer multilingual support and signage to accommodate passengers from different linguistic backgrounds, fostering a welcoming and inclusive environment for all passengers. The vessel will allow SF Bay Ferry to scrap an existing large diesel ferry. Additional details for the proposed new ZE vessel are provided in the Supplemental Application.

Buy America Act and Build America, Buy America Act Compliance. SF Bay Ferry has enlisted the services of specialists to review plans and specifications to evaluate Buy America Act and Build America, Buy America Act (BABA) Compliance; analysis indicated that the vessels, shore power systems and electrical infrastructure can be constructed in compliance with BABA. If components of the vessels or shore power systems are not fully compliant, the Port is confident that the compliance could be achieved under the provisions of the existing time-limited waivers under the Clean Ports Program.

Section 2 - Environmental Results—Outcomes, Outputs and Performance Measures

a. Expected Project Outputs and Outcomes

Table 1. Anticipated Outputs and Outcomes

Anticipated Outputs and Outcomes		
Activities	**Outputs**	**Outcomes**
1. Deployment of new ZE Electric Ferry Vessel	One new large, fast, ZE electric ferry vessel to be operated in place of a diesel vessel that would be relegated to backup spare use.	1) Approximately 88,000 tons of CO2 equivalent emissions avoided over the lifetime of the vessel. 2) Approximately 350,000 gallons of fuel consumption avoided over the lifetime of the vessel.
2. Deployment of Shore Power Charging Systems	Two shore power charging systems with total capacity of 17 (kW) to charge zero emission electric ferry vessels.	Systems perform reliably and support the successful and consistent operation of four zero emission electric ferries with expanded service relative to today.
3. Ferry system operations impact Environmental Justice	Project activities are designed to provide benefits to near-port communities impacted by Port emissions.	The project provides health benefits, noise reduction, and air quality improvements to disadvantaged communities.
4. Training and Workforce Development	200 participants from underserved communities will receive training and develop skills in the maritime industry with a specific focus on the new ZE technologies and equipment.	The workforce development program successfully contributes to creating a sufficiently large pool of crew and engineers qualified to operate and maintain ZE equipment. Current crews receive training and qualifications necessary to transition to work operating and maintaining ZE equipment.
5. Public Engagement and Outreach	Long-term recurring forums to engage communities and a publicly documented process for addressing community concerns; Documented	Community members and stakeholders are engaged and aware of the project and have contributed feedback that has been incorporated into its design, development, and operation.

	efforts to make residents aware of project and to solicit feedback.	
6. Organizational Development	Institutionalization of operational changes to accommodate future deployment of additional ZE technologies. Dissemination of experience and information gained by Port and partners (San Francisco Bay Ferry and SFPUC) in designing and deploying ZE vessels and equipment to support ZE ferry operations.	1) Support future deployment of additional ZE technologies as measured by share of total Port ferry arrivals and departures converted to zero emissions. 2) Implementation of SFPUC Capital Improvement Plan projects for shore power improvements along Port jurisdiction. 3) Submittal of project report to National Academy of Science Transportation Research Board for dissemination and publication.

b. **Performance Measures and Plan**

Table 2. Measurement of Outputs and Outcomes

Measurement of Outputs and Outcomes		
Activities	**Performance Measures**	**Timelines, Reporting, and Evaluation**
1. New ZE Electric Ferry Vessel	Emission reduction of new ZE electric ferry to be measured by: 1) Tons of CO2 equivalent emissions avoided annually and over the lifetime of the vessel relative to baseline 2) Gallons of fuel consumption avoided annually and over the lifetime of the vessel relative to baseline	1) Performance period: progress tracked in emissions against baseline inventory and diesel ferry operation; reported annually and evaluated against operational milestones and goals for service offerings 2) Long-term: progress in emissions tracked and evaluated against larger emissions reductions milestones (2030, 2050) for complementary programs and transparently reported with those results
2. Shore power Charging Systems	Reliability and performance of charging systems to be measured by: 1) System availability 2) Schedule adherence of ZE electric ferries 3) On-time trip performance of ZE electric ferries	1) Performance period: progress tracked by % of days charging systems are fully operational, number of trips made v. trips scheduled, and % of trips arriving within 10 minutes of schedule; reported quarterly and evaluated against regional transit performance standards 2) Long-term: progress measured by conversion of other regional ferry services currently serving the Port to ZE
3. Ferry operations impacting Environmental Justice	Improvement in non-attainment status of air quality standards in near-port disadvantaged communities to be measured by air toxics levels relative to baseline at the end of the performance period.	1) Project Performance Period: progress will be indicated by improvement in non-attainment air quality status in near-port disadvantaged communities; reported on cyclitic basis as evaluated by the County of San Francisco, Bay Area AQMD and California ARB 2) Long-term: progress will be evaluated by the ridership of the zero-emission ferry system; reported transparently and evaluated against project ridership projections

4. Training and Workforce Development	Adequate pool of qualified crews and engineers, and retention of existing employees measured by: 1) Quality of program 2) Position vacancy rates for crews and engineers operating and maintaining ZE equipment 3) Average employee tenure	1) Performance period: progress tracked by the completion rate of enrolled workforce development program participants; reported annually by Workforce Development Coalition and evaluated against the number of ZE operators and maintenance staff required. 2) Long-term: progress measured by average employee tenure and job classification vacancy rates in relevant work areas.
5. Public Engagement and Outreach	Effectiveness of project in creating awareness, and soliciting and responding to community feedback to be measured by: 1) Public awareness of project 2) On-line survey of community members and stakeholders.	1) Performance period: progress tracked by number of quarterly project social media and web-based impressions, and number of forums and community meetings hosted annually; effectiveness tracked by two surveys conducted during the performance period evaluating results against goals of soliciting and incorporating community input into project
6. Organizational Development	Successful organizational development and scalability of ZE deployment, including knowledge dissemination, to be measured by: 1) Dissemination of knowledge and experience to industry stakeholders 2) Number of total Port ferry arrivals and departures converted to zero emissions.	1) Performance period: progress tracked by presentation of project information at minimum of one conference or symposium annually and the % of total Port ferry arrivals and departures converted to zero emissions reported on an annual basis 2) Long-term: progress measured by conversion of other regional ferry services currently serving the Port to ZE

c. Timeline and Milestones

Table 3. Project Timeline and Milestones

Project Timeline and Milestones by Calendar Year Quarters						
	Downtown Ferry Terminal Electrification Project		**MBFL Shore Power and Anchoring Systems**		**New Zero Emission Electric Vessel**	
Milestone	Start	End	Start	End	Start	End
Design	Q1 - 2024	Q3 - 2025	Q1 - 2023	Q4 - 2024	Q1 - 2023	Q3 - 2024
Procurement, Bidding, and Award	Q4 - 2025	Q1 - 2026	Q3 - 2025	Q4 - 2025	Q3 - 2024	Q4 - 2024
Construction &/or Installation	Q1 - 2026	Q2 - 2027	Q1 - 2026	Q4 - 2026	Q1 - 2026	Q1 - 2028
Substantial Completion	Q2 - 2027	Q2 - 2027	Q1 - 2027	Q1 - 2027	Q1 - 2028	Q1 - 2028
Final Acceptance	Q3 - 2027	Q3 - 2027	Q2 - 2027	Q2 - 2027	Q1 - 2028	Q1 - 2028

Date of Operation	Q3 - 2027	Q2 - 2027	Q1 – 2028
Semi-Annual Reporting*	March 1 and Sept. 1	March 1 and Sept. 1	March 1 and Sept 1
Final Report Preparation	December 31, 2027	December 31, 2027	July 1, 2028

Estimated timeline to be finalized by the EPA.

d. Scrappage

SF Bay Ferry will scrap one of its large diesel passenger vessels with delivery and commissioning of the new large electric vessel funded through this grant request. The capacity and service functionality of the scrapped diesel vessel will be equivalent to that of the new large electric vessel. Details related are contained in Tab 4b of the Clean Ports Supplemental application.

Section 3 - Programmatic Capability and Past Performance

a. Past Performance and Reporting Requirements

The five grant-funded projects below demonstrate the Port's experience and capability of successfully implementing capital projects utilizing federal and state funding. The Port has never failed to submit timely reports that adequately report progress toward achieving expected outcomes.

#1 Project Title:Amador Street Infrastructure Improvement Project

Agreement #:	693JF72344034
Agency/ Listing #:	US Department of Transportation Maritime Division - 20.823
Description:	The U.S. Department of Transportation Maritime Administration (MARAD) awarded the Port of San Francisco $9,607,500 through their fiscal year 2022 Port Infrastructure Development Program (PIDP) to complete the construction phase of the Amador Street reconstruction and pump station.
Work Plan:	The project was designed by San Francisco's Public Works staff and will perform the design support during construction. Construction Management will also be performed by Public Works staff. The project is anticipated to advertise Q2 2024 through a low bid process. Construction completion is anticipated in April 2026.
Reporting:	The Port has submitted the required quarterly reports as outlined in the grant agreement. The first required quarterly report was submitted on April 21, 2024.

#2 Project Title:Heron's Head Park Shoreline Resilience Project

Agreement #:	F22AP00603-00
Agency/ Listing #:	Coastal Wetlands Planning, Protection and Restoration - 15.614
Description:	The US Fish and Wildlife Service awarded a grant of $987,000 administered to the Port through the State Coastal Conservancy as part of the Coastal Wetlands Planning, Protection and Restoration Act—National Coastal Wetlands Conservation Grants. The grant is to be used to perform habitat restoration at the Port's Heron's Head Park.
Work Plan:	The Port had a fully funded project to construct a new shoreline and plantings at Heron's Head Park, which was completed in 2022. The Port has committed to do 10 years of monitoring and additional plantings and invasive plant species removal. The NCWC funds are currently being used to pay for the plantings and invasive species removal.

Reporting:	Under the grant agreement for NCWC funds, the Port is required to submit quarterly requests for distribution with documentation of expenditures and a progress report documenting work completed during the subject reporting period. To date, the Port has completed one year of the grant-funded work program and submitted requests for distribution and progress reports in accordance with the grant agreement.

#3 Project Title:19th and Georgia Street

Agreement #:	STPL-6169(013)
Agency/ Listing #:	0417000103
Description:	The Port received a grant from the Federal Highway Administration that was administered through the Metropolitan Transportation Commission and Caltrans. This was used to pay for construction of the project.
Work Plan:	The Port bid the project out for construction and completed construction. It complied with the requirements of the grant and submitted all the required paperwork to administer the grant.
Reporting:	The Port adjusted its contract documentation and construction management procedures to follow grant requirements. Staff submitted invoices monthly and followed the Caltrans Local Assistance Procedures Manual guidelines.

#4 Project Title:Roundhouse 2 Roof, Solarium, and Windows Replacement

Agreement #:	CA Senate Bill 170. An act to amend the Budget Act of 2021
Agency/ Listing #:	State Lands, 21.027
Description:	The Port received a grant administered by the State Lands Commission for work that was affected by COVID-19.
Work Plan:	The Port designed and is in construction for a project to perform building envelope improvements of a four-story concrete commercial building owned by the Port. The scope of work includes replacing windows, the roof, and a solarium structure.
Reporting:	The Port currently reports to the State Lands Commission on a biannual basis, every May and November.

#5 Project Title:Downtown Ferry Terminal Expansion Project

Agreement #:	CA-04-0160, CA-2017-045, CA-2019-096
Agency/ Listing #:	FTA20.507 /FHWA 20.205
Description:	SF Bay Ferry partnered with the Port to utilize funding from State, SF sales tax, FHWA and FTA funding for modernization and expansion of the Downtown Terminal. Port managed Sales Tax funding provided for the project while SF Bay Ferry managed remaining funds.
Work Plan:	Project developed and constructed a $100 million expansion of the Downtown San Francisco Ferry Terminal to increase berthing capacity, implement seismic upgrades, as well as modernize and enhance public access. This project was completed in 2021.
Reporting:	Expenditures of federal funds were reported quarterly to FTA and included expenditures as well as milestone progress against the schedule and budget.

b. Staff Expertise

Staff who will be managing and overseeing this project include highly experienced professionals with decades of experience in project delivery. Staff biographies are attached, and team highlights include:

Shannon Cairns, Port Program Manager: Over 15 years of experience managing complex interdisciplinary projects in both the private and public sector.

Kathryn Purcell, Port Program Manager: Over 25 years in environmental review and waterside development.

Jan Rybka, MS, PE, SF Bay Ferry Senior Project Manager & Marine Engineer: Over 20 years in marine engineering, professional licensed naval architect and marine engineer, and retired Coast Guard Officer.

Chad Mason BS, MA, SF Bay Ferry Senior Planner and Project Manager: Over 20 years of experience in environmental planning and ferry capital project delivery

Matthew C. Ho PE, SFPUC/Power, Senior Engineer, and Manager of Distribution Engineering: Over 20 years of experience in electrical engineering and distribution design.

Section 4 – Environmental Justice and Disadvantaged Communities

Table 4: Summary of Nonattainment Areas and Air Toxics Concerns

	Downtown San Francisco Ferry Terminal	**Mission Bay Ferry Landing**	**Alameda County**
Facility Information	Pier 1, The Embarcadero, San Francisco, CA 94111, San Francisco County	Central Waterfront, San Francisco, CA, 94111, San Francisco County	Oakland Ferry Terminal; Alameda Seaplane Lagoon Ferry Terminal
Project Activity Description & Share	Construction and ferry service; 33%	Construction and ferry service; 33%	Ferry service; 33%
Does the county contain PM2.5 or Ozone Nonattainment areas?	YES, moderate (PM2.5 2006) and marginal (Ozone 2008 & 2015 8hr Standards) non-attainment areas		
Does the county contain high ambient diesel PM concentration?	YES, High Ambient Diesel PM Concentration (>80th percentile, 2019 Air Toxics Screening Assessment)		

a. Disadvantaged Communities: Nonattainment Areas

The Port of San Francisco is in San Francisco County (FIPS 06075). The 2024 Clean Ports Disadvantaged Community County List identifies the county as meeting the disadvantaged community definition, with additional specific indicators for poor air quality and Nonattainment areas (see, **Table 4**). The project benefits identified in Section 2a will flow directly to these communities in the service area experiencing disproportionate climate, economic, and social burdens, including West Oakland which is in the 99th percentile of those most impacted by exposure to diesel particulate matter and the 99th percentile of asthma risk for sensitive populations (see, **Figure 1**).

Figure 1: Ferry terminal locations (points), Port Boundaries (green) and Justice40 DAC tracts (gray).

b. Disadvantaged Communities: Areas with Air Toxics Concerns

The census tract of the primary project location (06075017902) is in the 97th percentile for diesel PM exposure (2021 CEJST Screening tool), and >80th percentile for modeled ambient diesel concentration (2019 Air Toxics Screening Assessment, 0.38 µg/m3). The new ZE ferry would also operate in Alameda County, which contains moderate PM2.5 (2012) Non-Attainment Areas and marginal 8-Hour Ozone (2008, 2015) Non-Attainment Areas; the census tracts of the ferry terminals (06001428700 and 06001983200) are >80th percentile for modeled ambient diesel PM concentration.

c. Community Engagement Prior to Application and During Project

The Port and SF Bay Ferry utilize multiple outreach methods to ensure communities, including disadvantaged and low-income communities, are engaged in the agency's decision-making process, project planning and design of the project. SF Bay Ferry has taken an inclusive and targeted approach to outreach, offering many different types of forums for people to provide input on the projects and feedback. These forums include using community-based organizations to reach out to their constituents, participating in community events, holding formal public participation meetings at different times/days, online and onboard multilingual surveys, multilingual community open houses, local and regional government coordination meetings, focus groups and co-creation workshops, and small group conversations with business and non-profit representatives.

As a regional transit operator connecting different geographies in the Bay Area, WETA also engages communities on a broader scale throughout the cities and counties where ferry terminals are currently located (including the cities of Vallejo, Richmond, Alameda, Oakland, San Francisco and South San Francisco and the counties of Solano, Contra Costa, Alameda, San Francisco, and San Mateo.)

San Francisco and Bay Area residents, workers, and waterfront stakeholders have an appropriately high level of interest in how the Port manages and develops its lands. The Port Commission and staff rely on the discussions, ideas, and comments about waterfront improvements and Port operations that emerge from these public forums to modify its plans and how it manages the waterfront.

- The **Port Advisory Committee (PAC)** provides regular opportunities for public discussions about Port operations and improvements proposed along the waterfront. Members of the PACs, include [ADD MEMBERS]and provide the Port Commission and staff with important insights on neighborhood, business, tenant, maritime, land use planning, historic preservation, and environmental issues. PAC meetings provide for open, two-way exchange that over time has built a sophisticated public understanding about waterfront needs, financial realities, and trade-offs that must be balanced to achieve common goals and aspirations.
- The Port coordinates a **Maritime Commerce Advisory Committee (MCAC)** that includes representatives from organized labor and the Port's diverse maritime businesses and is open to the public. The MCAC helps keep the Port up to date on maritime business needs and changes. They provide a forum for addressing maritime market needs and opportunities, along with the balance between maritime requirements and other public trust and City needs.
- The Port convenes the **Southern Advisory Committee (SAC)** monthly to gain insight on neighborhood, business, tenant, maritime, land use planning, and environmental justice issues facing the Port's Southern Waterfront. Committee members are appointed by the Port's Executive Director and reflect the diversity of residents, business, and environmental interests in the area.

Prior to the application, the Port and its partners engaged frequently with the community to share plans for expanding ferry service in the Bay Area and transitioning to zero-emissions ferries. Community feedback highlighted the need to expand passenger services while reducing environmental impacts. This project responds to community feedback by accelerating the transition to zero-emission ferries. Prior engagement included the following:

- **Advisory Groups.** Between 2017 and the present, the Port has regularly conducted community outreach to the Port's advisory committees including the Maritime Commerce Advisory Committee, Southern Waterfront Advisory Committee, and the Southern Advisory Committee. The committees have been very active in providing input to staff on ferry enhancements to support operation of the Bay Area's first zero emission ferries. In addition, the Port is served by community advisory groups that are appointed by the Port Executive Director and represent stakeholders ranging from residents, neighborhood organizations, environmental advocates, economic development interest, transportation and parking advocates, parks and open space interest and Port tenants.
- **Community-Based Organizations (CBOs)**. Engaging CBOs has been paramount in gaining input from disadvantaged communities. In January 2023, SF Bay Ferry held listening sessions with nine community groups including Alameda Point Collaborative, One Treasure Island, Transport Oakland, Vallejo Project and many others discussing participant's transportation needs and opinions about existing and potential service, including the benefits of electrification to their communities. Feedback from this engagement resulted in the momentum to make several changes to SF Bay Ferry's programs and services including developing a more robust ferry service expansion plan, making SF Bay Ferry's Pandemic Recovery Program's temporary 30% reduction in fares permanent and fast tracking the electrification of ferry service on the San Francisco Bay.
- **Public Sector Working Groups.** In early 2023, SF Bay Ferry met regularly with five county working groups to discuss the future of ferry transportation, including elected officials, maritime operators, labor unions, and advocacy organizations from the counties of San Francisco, Alameda, Contra Costa, Solano, and San Mateo counties. Fifteen one-on-one stakeholder interviews, five focus groups, and an online questionnaire were conducted. SF Bay Ferry staff convened 44 stakeholders as part of the county working group's workshop. Participants discussed how the future could best be served by ferry service, including electrification of the Bay Area's ferry fleet. These groups took a deeper dive into technical elements and provided input on environmental impacts, especially those in sensitive protected shoreline areas. Port staff have been participating in the AB 617 working group, convened by the Bay Area Air Quality Management Group. This group works with other local air districts, community groups, community members, environmental organizations, regulated industries, and other key stakeholders to reduce harmful air pollutants, including developing strategies such as electrification of port properties and associated vessels.
- **Online Community Survey.** San Francisco Bay Ferry implemented an online survey over a three-month period in 2023 and received over 4,500 responses. The survey included six questions about the future ferry system and its trade-offs, including how to balance affordability, service frequency, service speed, coverage, and environmental sustainability. While trip frequency was listed as the top priority for current and potential ferry riders, environmental impact of ferry trips was listed as a priority when deciding whether to take the ferry over other travel modes, with zero emissions ferries listed as a top four desired outcome by survey participants.
- **Community Meetings.** For more detailed information, the use of community meetings provided the Port of San Francisco with the opportunity to engage the public on the Mission Bay Ferry Landing

project. At these meetings Port of San Francisco staff conveyed project information, while also obtaining input from participants on the project. The Port held over 100 community meetings and will continue through the duration of project implementation.

- **Online Information.** Providing online project information is a key communications strategy for any project, including those in this application. SF Bay Ferry created a website dedicated to the future of San Francisco Bay Area ferry service and provides public input to-date, including survey results, service vision information and more. The Port has a webpage dedicated to the MBFL project that provides a comprehensive overview of projects and plans as well as project updates.

d. Long-Term Community Engagement

Both the Port of San Francisco and SF Bay Ferry have a commitment to meaningful community engagement in the development and implementation of their projects and programs. The agencies have established community engagement policies that outline specific strategies for including near-port communities in decisions that affect them, including those that impact air quality.

Near-term (Year 1 and 2). San Francisco Bay Ferry will conduct outreach surveys and listening sessions as part of an awareness campaign during the summer of 2024 with East Bay Latinx and African American residents who do not normally ride the ferry to identify barriers to traveling to work, recreational and other opportunities in San Francisco, and will address the relevance of sustainability and air pollution prevention to riders. The agency will use learnings from the engagement to develop an outreach and awareness campaign in late 2024. SF Bay Ferry is part of a public private partnership formed to conduct a hydrogen vessel demonstration project to test and further understand hydrogen fuel cell technology. The demonstration project will start operating along the Port of San Francisco's waterfront from Pier 41 to the San Francisco Ferry building this June (2024) and will feature educational displays on zero emission vessel technology, the public health benefits of zero emission ferries and more about SF Bay Ferry's plans to transition to zero emissions. This demonstration project will be free to the public thanks to the public private partnership with United Airlines, Golden State Warriors, Golden Gate Ferry, and another soon to be announced partner. The Port of San Francisco will continue to use its advisory and community committees to gather feedback to ensure two-way engagement from residents and the maritime community.

Medium-term (Year 3 & 4). Medium-term engagement will convey the importance of electrification on near-port communities, including how electric ferries will reduce greenhouse gas emissions and air pollutants in the Bay Area; encourage the use of electric ferries, especially to those in disadvantaged communities; and provide ongoing information on project performance to the Bay Area public and stakeholders. The project's Community Engagement Plan will utilize advisory committees, community groups, televised and recorded meetings, pop-up engagements at existing and recurring popular events, digital promotions and newsletters, industry group-based outreach, public workshops, and local press.

Dedicated Resources. The Port has seven public relations and planning staff who regularly commit their time to community engagement, including through communications and public meetings such as waterfront advisory committees. SF Bay Ferry has several departments responsible for community engagement including public information and marketing, government & regulatory affairs, and planning. Between these departments, three full-time staff are dedicated to community outreach versed in specific expertise. SF Bay Ferry also dedicates $200,000 annually to contracts with community outreach firms that have established relationships with community-based organizations in particular areas.

Section 5 – Project Sustainability

a. Baseline port mobile source inventory for greenhouse gases, $PM_{2.5}$ and/or NO_x

Sources of mobile emissions at the Port include Port operations but are largely attributable to tenant operations. The Port of San Francisco hired consultants to prepare emissions inventories from mobile sources in 2005, 2010, and 2017. The two primary mobile sources were Ocean-Going Vessels and Harbor Craft. Ocean-Going Vessels were comprised of cruise ships (80%) and vehicle carriers (20%). Most cruise ships utilized shoreside power at berth. Harbor Craft were comprised of assist tugs, tug and barge, excursion ferries. In keeping with the first two inventories, the 2017 inventory excluded commuter ferry operations. The inventories provide estimates for emissions of five criteria pollutants:

- Reactive organic gases (ROG)
- Carbon monoxide (CO)
- Nitrogen oxides (NOx)
- Particulate matter, including diesel particulate matter (PM)
- Sulfur oxides (SOx)

The 2017 inventory also included three greenhouse gas (GHG) components: carbon dioxide, methane, and nitrous oxide, expressed as carbon dioxide equivalents that reflect the relative global warming potential of each. From 2005 to 2017 the most notable changes were decreases in NOx and SOx. ROG levels and CO increased very slightly and PM10 decreased. Excursion ferries comparisons were complicated by errors in 2010, but overall, emissions decreased. This is attributed to a slight reduction in excursion activity but also to a switch to cleaner engines. The California Air Resources Board (CARB) estimates ferries account for 11% of transportation related GHG emissions.

The Port commits to developing an updated Port Mobile Source Emission inventory that will include ferries and track progress in reducing mobile point source emissions in Port of San Francisco jurisdiction within the project performance period (< four years). This inventory will be made publicly available and specifically reviewed with stakeholders and community members in nearby disadvantaged communities.

b. Plan to reduce port mobile source emissions.

The Port's long-term goal is to achieve net-zero emissions for Port operations by 2050, a commitment reflected the Sustainability Goal of the Port's Strategic Plan. Interim steps include converting the Port fleet to zero-emissions and supporting alternative fuels for ferries. The Sustainability Goal is supported by the Port's Sustainability Framework, which provides a detailed and systematic assessment of sustainability targets for specific issues. Electrification is critical to achieving these goals and will build on innovative work the Port has accomplished.

To complement the efforts to reduce maritime mobile source emissions, the Port will be initiating a grant-funded project to reduce emissions from heavy-duty commercial trucks. A portion of Pier 96 is used to provide parking for Class-8 trucks owned by independent operators and small fleets. The project will assess the feasibility of upgrading infrastructure at Pier 96 to support fueling of both battery electric and hydrogen fuel-cell trucks and to provide resources to assist the independent operators to become early adopters of the zero-emission trucks. This would also reduce emissions that affect the Bay View Hunters Point community identified by the California Air Resources Board as a community that would benefit from emissions reduction strategies. The Port is committed to working with BAAQMD and the community on the CERP within the project performance period.

Section 6 – Job Quality and Equitable Workforce Development

Through this project, the Port of San Francisco will drive job creation to support a diverse economy, reinforcing the vital role of maritime industries in the Bay Area. The Port's approach will maximize the benefits of this funding opportunity, to create a racially diverse maritime workforce, while contributing to long-term economic growth and sustainability of maritime jobs in the Bay Area by providing the bellwether for recruitment efforts in the maritime workforce nationally.

a. Supporting high quality jobs

Project-Specific High-Quality Jobs Created and Supported. This project will create an estimated 300 direct jobs and 600 indirect jobs. In addition, the Workforce Development Program will train over 200 apprentices and expand collaboration with local community colleges and universities to adapt existing programs or develop new programs.

Workforce Training. The Port of San Francisco and the Water Emergency Transportation Authority will work with the WWC, a regional non-profit that provides workforce training in marine trades and water transportation careers specifically for 18–24-year-olds from low-income and disadvantaged communities in the greater Bay Area as well as re-entry individuals leaving the prison system. WWC partners include the Workforce Development Boards for Alameda, Contra Costa and Solano counties (an agreement with San Francisco County Workforce Development Board is currently under development); Alameda County Probation Department; maritime industry employers, such as commercial harbor craft operators including ferry operators and tug boat operators; shipyards and associated maritime suppliers; labor unions, such as the Machinist Institute, Inland boatmen's Union of the Pacific, International Order of Masters, Mates & Pilots, and the California Labor Federation; community based organizations such as West Oakland Job Resource Center and Five Keys Schools and Programs; and the California State University Maritime Academy.

WWC will provide paid training programs for up to 200 participants over four years who will participate in short-term focused training that will rapidly prepare them for work in the marine trades and water transportation fields, including operating and maintaining zero-emission ferries and harbor craft. The WWC is guided by an Industry Advisory Board (IAB) consisting of employer and worker representatives, along with industry experts to work collaboratively to develop accelerated short-term training curricula for participants, based upon industry need. The IAB has a First Source Hiring Agreement, to be signed by partner employers, that prioritizes WWC training graduates in hiring. For training on the project's equipment, WWC will work directly with the Port and WETA to develop training specific to the infrastructure and operation of the new vessel and shore power charging system, including electrical work required for the maintenance and repair of electric vessels.

The WWC can train workers quickly and will fill the current and future demand for jobs in the marine trades and water transportation sectors. The WWC also includes many wrap-around services to ensure the participants' success, including soft skill development courses, general resources, childcare and food assistance, and legal support to help overcome any barriers to gaining the required credentials to operate in the maritime industry. Those who complete the training will be placed in apprenticeships and employment in family-sustaining good jobs, including those on this project. The WWC has an administrative staff that provides graduating apprentices with ongoing job placement assistance. The design of the WWC training program supports high quality jobs with benefits such as health insurance, retirement plans, workers' compensation benefits, paid leave and care giving support and is fully aligned with the Good Jobs principles. WWC will offer three specific course types:

- **Marine trades**: WWC offers a 10-week course preparing participants in the following marine trades careers/skills directly related to this project: marine machinist; marine technician; marine welder; marine painter; marine carpenter; marine electrician; marine pipefitter; crane and forklift operator; drydock operator; and pile driver.
- **Water transportation**: WWC offers a 1–2-week course preparing students in the following careers/skills: masters (also called captains); mates; pilots; sailors, deckhands; marine oilers; station attendants; and ship engineers. This course is tailored to accommodate the additional training needed to address any differences between a combustion vehicle and an electric vehicle.
- **Electronic Drive Technician** (add-on training): WWC will work with Port of San Francisco and SF Bay Ferry staff to create an add-on training for mid-level electronics technicians to obtain the skills needed to maintain and repair electric vessels, including safety training, which will ensure the safety of staff while maintaining and repairing high voltage equipment.

Workforce Development Program. Ensuring that existing and future employees are adequately trained in the new equipment is critical to the success of the implementation of the zero-emission fleet transition. In 2021, SF Bay Ferry received a grant from the California Energy Commission, to support the development of a blueprint to transition to zero emissions. This plan included an assessment of the current workforce capabilities and identified the new roles, skills and training required for the existing workforce to operate and maintain the zero-emission technology that will be implemented through this project. In partnership with the Working Waterfront Coalition, the Workforce Development Program for this project is being developed based on the specific zero emission technology being implemented in this project, including development of a new electronic drive technician training course. Existing commissioning and new hire training protocols were modified based on the expected new ZE skills and safety training. Workforce-related risks were also identified, and appropriate risk mitigation strategies were proposed for the successful implementation of ZE technology. The final Workforce Development Program will also include procedures to overcome any workforce issues that could create risk for the successful implementation of a zero-emission ferry system. The Port and WETA will use this plan to ensure that the proposed project provides employment and workforce development and training benefits to the community, particularly to priority populations.

Worker and Passenger Safety. SF Bay Ferry has historically worked with unions to develop a project labor agreement (PLA) for large terminal construction projects that includes robust worker safety policies. For the WWC program, all marine trades students will complete the Occupational Safety and Health Administration (OSHA 10) Construction Safety training taught by industry employers and will receive a certificate of completion. In addition, project partners will provide training required for the manufacturing, maintenance and repair of electric vessels and charging equipment. All safety protocols will be updated to reflect safety requirements for the new equipment.

Ports that serve people must also consider the safety of everyday passengers when contemplating a transition to zero emissions, which is a unique challenge for the Port of San Francisco. As part of the project's early development, SF Bay Ferry has proactively engaged the United States Coast Guard, local building, and fire departments to advise on the design on the zero-emission equipment to ensure the highest level of safety and the groundwork for compliant and effective passenger safety protocols. The Port and SF Bay Ferry will share these passenger safety protocols with other ferry operators to accelerate the transition to zero-emission water transit.

Worker and Labor Engagement. The Port, in partnership with WWC, will recruit participants through partnerships with community-based organizations, county workforce development boards and

probation departments in Alameda, Contra Costa, Solano and San Francisco Counties and others. WWC will assist participants in securing well-paying jobs via First Source Hiring Agreements with Bay Area maritime employers. A First Source Hiring Agreement allows the member employers to have the first chance at hiring WWC graduates. WWC is working with the local unions, including the Inlandboatmen's Union (IBU) of Pacific, the International Organization of Masters, Mates and Pilots, and the Machinists District Lodge 190 to create the training program and to recruit and hire participants from low-income, disadvantaged communities and the re-entry population. Many of the positions will be union represented positions. The primary strategy for amplifying the worker's voice will be the inclusion of key worker representatives at the IAB (see attached letters of commitment). Worker representatives who have committed to participation in the IAB include the California Labor Federation; the Inland boatmen's Union of the Pacific; the International Organization of Masters, Mates and Pilots; and the Machinists Automotive Trades District Lodge 190. Worker members of the IAB will contribute to the design, implementation, and evaluation of the training program curriculum.

Benefits and Pay. The positions available to recent WWC graduates employed to operate equipment and maintain technology for this project will be high paying (prevailing wage) positions with full benefits including health insurance, retirement plans, workers' compensation benefits, paid leave and care giving support. The wages will be determined via negotiations with labor unions and companies. Additional benefits associated include many wrap-around services such as soft skill development courses, general resources, childcare and food assistance, and legal support.

b. Expanding access to high-quality jobs, including for people in low-income and disadvantaged near-port communities.

The Working Waterfront Coalition training program is designed to connect low-income workers from disadvantaged communities with good quality, high paying jobs, offering entry opportunities with pathways to advancement. Traditional word of mouth communication of job opportunities in the marine trades has significantly limited the maritime workforce's diversity. The Port and its workforce partners will use the following strategies for attracting, retaining, and placing individuals with low incomes from disadvantaged communities into high-quality jobs in the marine trades and water transportation fields:

- **Use of Community Groups, Workforce Boards and Internet in Recruitment**: The Port and WWC will partner with community-based organizations and workforce development boards in San Francisco, Contra Costa, Alameda and Solano Counties (letters of commitment attached) that work with underserved populations, including English Language Learners (ELLs) and immigrants, returning citizens, and youth, the project will reach out intentionally to communities that have not traditionally been exposed to career opportunities in the marine industry. The WWC has developed an effective advocacy program promoting its training opportunities online via targeted social media and internet marketing using social media experts in the 18–24-year-old range from disadvantaged communities such as Richmond, CA. This will enable WWC to expand its reach to those who would not normally have access to these opportunities.
- **Customize training and support**: To support the projects in this grant, WWC will work with San Francisco Bay Ferry staff to create a training for mid-level electronics technicians to obtain the skills needed to maintain and repair electric vessels. All participants will receive training in essential (soft) skills such as effective communication, customer relations, and good work habits, increasing their likelihood of placement and retention in marine employment. WWC will also provide a full suite of wrap-around services to ensure the success of the program's participants, including a stipend to

cover general expenses, transport to and from classes, access to child-care, nutrition assistance, soft skill development, legal assistance, and more.

- **Provide Hiring and Retention Support:** Employers will have direct input in designing WWC training around the specific needs of the industry, which will ensure that participants develop the relevant skills they need to be hired. Once participants enter apprenticeships or employment, there are clear pathways and a strong employer commitment to helping workers develop their skills and move to better paid employment. First Source Hiring Agreements signed by employers have been shown to increase placement of training participants in employment. Offering a wide array of career pathways to participants will also increase the likelihood that participants can select a pathway that aligns with their interests.

Section 7 – Project Resilience to Climate Impacts

The Port has been proactive in addressing the resilience of its waterfront jurisdiction to potential impacts from climate change, specifically in relation to sea-level rise. Specific to this project, several measures have been implemented or are proposed to ensure resilience to future climate impacts and protect grant-funded equipment and vessels. At all three terminal sites where shore power charging systems will be installed, wharf elevations will be raised to protect from total water levels projected to occur due to rising sea levels and increasing severe storms over the next 50-75 years. Components of the shore power charging systems would be secured to floating facilities that rise and fall with tides, preventing flooding or inundation during severe storm events. Access ramps connecting the wharf areas to floating facilities have been upsized to ensure safe and ADA compliant grades are maintained during all tidal conditions now and into the future. Lastly, wharf facilities have been designed to Essential Facilities Standards to address the potentially compounding risks of seismic activity near the project site as it relates to resiliency. Cooling systems for the shore power charging systems will be designed to account for future extreme heat events. The project site and grant-funded equipment are not vulnerable to extreme cold weather, drought, or wildfire risks.

Section 8 – Budget

a. Budget Detail

The San Francisco Bay Emissions-Free Ferry System budget is $70.9 million, including a request for $55.4 million (78%) EPA Clean Ports grant funding and $15.5 million (22%) matching funds. **Notably, $42.0 million (59%) of the total project budget will go directly to the purchase and installation of a high-speed electric vessel and a shore power and anchoring system to charge vessels.** The remaining $28.9 million (41%) will support costs associated with design, permitting, and construction management as well as deliver construction of behind the meter infrastructure.

Project Expenditures – The $70.9 million Project budget includes the following expenditure line items:

Project management staff ($0.2 million). The Port has assigned two project managers to oversee project implementation. While the hours vary from week to week, on average, staff will oversee the project for approximately 100 weeks at the following rates:

- Shannon Cairns, Project Manager: $119/hr. x 100 weeks x 10 hrs./week = $95,000
- Kathryn Purcell, Project Manager: $100/hr. x 100 weeks x 6 hrs./week = $56,000
    - Subtotal Salaries = $151,000
    - Fringe: 32% Fringe Rage x $151,000 total salaries = $51,000
    - *Total Salaries + Fringe = $203,000*

Contractual ($2.9 million). The Port is requesting funds to complete final design, permitting, and regulatory steps ($0.5 million) as well as for construction management, inspections, and monitoring ($2.4 million) of construction of electrification infrastructure and equipment.

Construction ($2.1 million). The Port will directly manage behind the meter construction at the Mission Bay Ferry Landing, totaling $2.1 million.

Other/ Subawards ($65.8 million). The Port is partnering with SF Bay Ferry and the SFPUC to deliver critical equipment, infrastructure, and workforce development services, as follows:

- SF Bay Ferry ($48.8 million) to manage construction of high-speed electric ferry vessel, behind the meter infrastructure as well and procure a shore power and anchoring system. This budget includes $2.0 million for the Working Waterfront Coalition to provide critical workforce development services that will directly support ongoing operations of the electrified ferry system.
- San Francisco Public Utilities Commission ($17.0 million) to deliver behind the meter infrastructure to the shore power and anchoring systems. This subaward includes an SFPUC match of $13.6 million to the $3.4 million EPA grant request. The SFPUC is responsible for planning, designing, and engineering its electrical service facilities and service laterals using well-developed and proven SFPUC standards for design, materials, and construction.

Project Sources/ Matching Funds – In addition to the $55.4 million (48%) grant request, the Project budget includes $15.5 million (22%) matching funds from a variety of local and state sources:

SFPUC ($13.6 million). The SFPUC has committed $31 million to expanding grid capacity along the waterfront to meet growing demand, including to serve cruise and other passenger vessels.

CalSTA/ Transit and Intercity Rail Capital Program (TIRCP) ($1.0 million). The State of California's TIRCP funds have been awarded to SF Bay Ferry to support behind the meter infrastructure costs.

Regional Measure 3 ($0.9 million). Regional Measure 3 (RM3) was approved by a majority of voters in the nine Bay Area counties in 2018 and authorized a three-dollar bridge toll increase on the Bay Area's state-owned bridges to fund a comprehensive program of regional transportation improvements. RM3 includes capital funds for WETA, of which $0.9 million is provided to support BTM infrastructure costs.

Leveraged Funds – Delivery of the entire ZE ferry service to San Francisco leverages over $115 million from other local, state, and federal sources that were applied to earlier phases or support ineligible expenses for the grant, such as front of meter infrastructure, environmental remediation of waterways approaching the ferry terminals, and ferry terminal infrastructure. These sources include:

Regional Measure 3 ($45.3 million). RM3 funding will fund three small electric vessels programmed to serve Downtown and Mission Bay and Treasure Island. This funding will also deliver non-grant eligible construction components such as the fixed pier, gangway, and front of meter infrastructure.

CalSTA/ Transit and Intercity Rail Capital Program ($27.2 million). The TIRCP funds support early design and procurement of shore power and anchoring systems needed for this service and two small electrified zero emission vessels. This funding will also fund delivery of non-grant eligible construction that are critical for full implementation of the project.

FTA/Rapid Electric Emission-Free (REEF) Ferry funding, ($13.1 million). These Federal Transit Administration (FTA) funds were awarded to support early procurement of one small electric vessel and the shorepower systems at the Downtown Terminal critical to full implementation of the project.

City and County of San Francisco Capital Funds ($20.9 million). Several departments within the City and

County of San Francisco, including the Port and the City's General Fund, funded early-phase project expenses including design, permitting, and environmental mitigation.

San Francisco Sales Tax ($4.5 million). This local funding is being used to support environmental mitigation of the waterways utilized by the ferry system.

Private ($4.0 million). A private business has pledged $4.0 million to the project, recognizing the benefit of improving and diversifying transportation options for its employees, to support environmental mitigation of the waterways utilized by the ferry system and other non-grant eligible expenses.

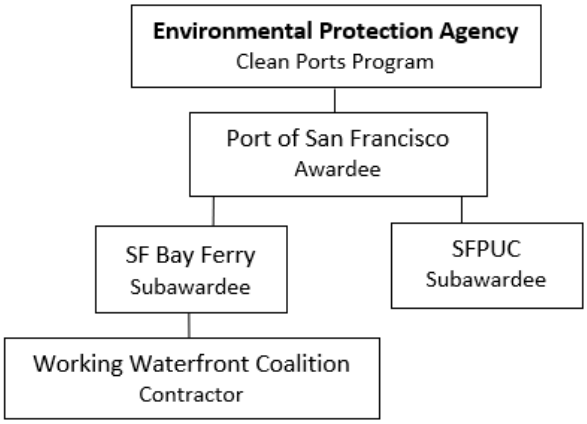
Table 5: Project Budget Overview

Line Item & Itemized Cost	EPA Funding	Non-Federal Cost Share
Personnel		
(1) Project Manager @ $119/hr x 10 hrs/wk x 100 wks	$95,000	$0
(2) Project manager @ $100/hr x 6 hrs/wk x 100 wks	$56,000	$0
TOTAL PERSONNEL	$151,000	$0
Fringe Benefits		
Full-time Employees @ 32% of Salary and Wages x Total Personnel	$51,000	$0
TOTAL FRINGE BENEFITS	$51,000	$0
Contractual		
Design, Entitlements, & Regulatory Fees	$500,000	0
Construction Management, Inspections, and Monitoring	$2,394,000	0
TOTAL CONTRACTUAL	$2,894,000	$0
Construction		
Behind the Meter Construction	1,128,000	$937,000
TOTAL CONTRUCTION	$1,128,000	$937,000
Other		
Subaward: San Francisco Bay Ferries	$47,762,000	$1,000,000
Shore Power & Anchoring Systems	*$14,000,000*	*$0*
Equipment: High Speed Vessel	*$28,000,000*	*$0*
Behind the Meter Construction	*$3,762,000*	*$1,000,000*
Workforce Development (Working Waterfront Coalition)	*$2,000,000*	$0
Subaward: San Francisco Public Utilities Commission	$3,400,000	$13,600,000
TOTAL OTHER	$51,162,000	$14,600,000
TOTAL FUNDING *Percent of Total Project*	**$55,386,000** *78%*	**$15,537,000** *22%*
TOTAL PROJECT COST		**$70,923,000**

ZE mobile source equipment *Percent of Total Project*	**$42,000,000** *59%*

b. Expenditure of Awarded Funds

Figure 2: Organization Chart



The Port, SF Bay Ferry and the SFPUC have been working collaboratively for several years on a plan to deliver the proposed project. Upon grant award, the Port will enter formal memoranda of understanding with subawardees SF Bay Ferry and the SFPUC to clearly delineate project and financial responsibilities related to their subawards (see Organization Chart, Figure 2). SF Bay Ferry will contract with the Working Waterfront Coalition and take responsibility for management of program outcomes for that entity. Additionally, each subawardee will develop a project controls team for each component to include engineering, finance, contractual, and communications managers to coordinate management of the project. Key to project controls is oversight of schedule and budget and will include financial staff experienced with managing federal funds to ensure compliance with EPA grant regulations and overarching OMB federal funding rules. Program management will follow best practices such as monthly meetings to review risk registers, cost-loaded schedules, potential delays, cashflow and delivery progress. Communication between the project staff and EPA will be prioritized to ensure responsiveness to the EPA's expectations and needs.

c. Reasonableness of Costs

Cost estimates were developed through close collaboration between the Port and its partners and utilizing input from utility and marine engineering firms.

Project management staff. Personnel costs are based on current hourly and fringe rates of the individuals assigned to the project and an estimate of staff time that will be dedicated to the project.

Contractual. The Port developed the cost estimate for design and permitting consultants utilizing service rates from a competitively procured contract with COWI/OLMM, JV. The Port will select a construction, management, and inspection firm from its as-needed engineering pool that was competitively selected in 2022. The anticipated cost of services is 10% of construction costs per prior project performance.

Construction. The Port completed several rounds of cost estimating for the construction of MBFL that includes escalation of a completed bid process in 2019 for the first phase of the project, which has already been completed. A cost estimator developed the current cost estimate by directly contacting manufacturers and by escalating expenses.

Other/ Subawards. The SFPUC and SF Bay Ferry each completed planning processes to develop cost estimates for the delivery of infrastructure, critical equipment, and workforce development:

- SF Bay Ferry – SF Bay Ferry will be delivering the vessel and shore power systems. Project management staff and industry leaders have developed a comprehensive plan to build out vessels and infrastructure. Over the past three years SF Bay Ferry has engaged with industry leaders including Aurora Marine Design, Elliott Bay Design Group, Liftech, and ARUP. Working closely with industry has allowed the agency to learn from recent electrification projects. Wartsila has been selected to act as the ferry system integrator to ensure engineering and design align with equipment

availability. Wartsila has extensive experience in Europe having successfully led zero-emissions ferry builds there. Liftech has, to date, acted as the structural engineer for the design work to date for the proposed shore power and anchoring system. Liftech was extensively involved in the original design and construction of the Downtown San Francisco facility. The design of the shore power system is currently 90% and is scheduled to begin procurement activities by the end of June 2024.

This is critical to ensuring that the vessels and systems are integrated and performing as a system to rapidly charge the vessels. Added to this knowledge is the decades of experience by the engineering team in managing vessel construction projects. Each class of vessel delivered by the team has brought new technology and emissions improvements. These costs have been escalated to the year of proposed delivery and the costs have been approved by the Executive Director of SF Bay Ferry, Seamus Murphy.

- SFPUC – The SFPUC will deliver a shared duct bank in Spear Street alignment segment of the DFT Electrification Project. The estimated cost for this segment is $10,000 per linear foot. This estimate was provided by the SFPUC based costs from a recent similar scope project completed by the SFPUC (Bay Corridor Transmission and Distribution Project).

Section 9 – Attachments

- *Statutory Partnership Agreement (Required, if applicable): Not Applicable.*
- *Intertribal Consortium documentation (Required, if applicable): Not Applicable.*
- **Applicant Fleet and Infrastructure Description (Required):** See attached.
- **Project Team Biographies**: See attached.
- *Negotiated Indirect Cost Rate Agreement: Not Applicable.*
- **Letters of Commitment**: See attached.
- **Letters of Support**: See attached.
- **Documentation of Partnership with Utility**: See attached.
- **Supplemental Application Template:** See attached.