

PARTNERING ON A RESILIENCY SOLUTION FOR SEAPORT EMISSIONS

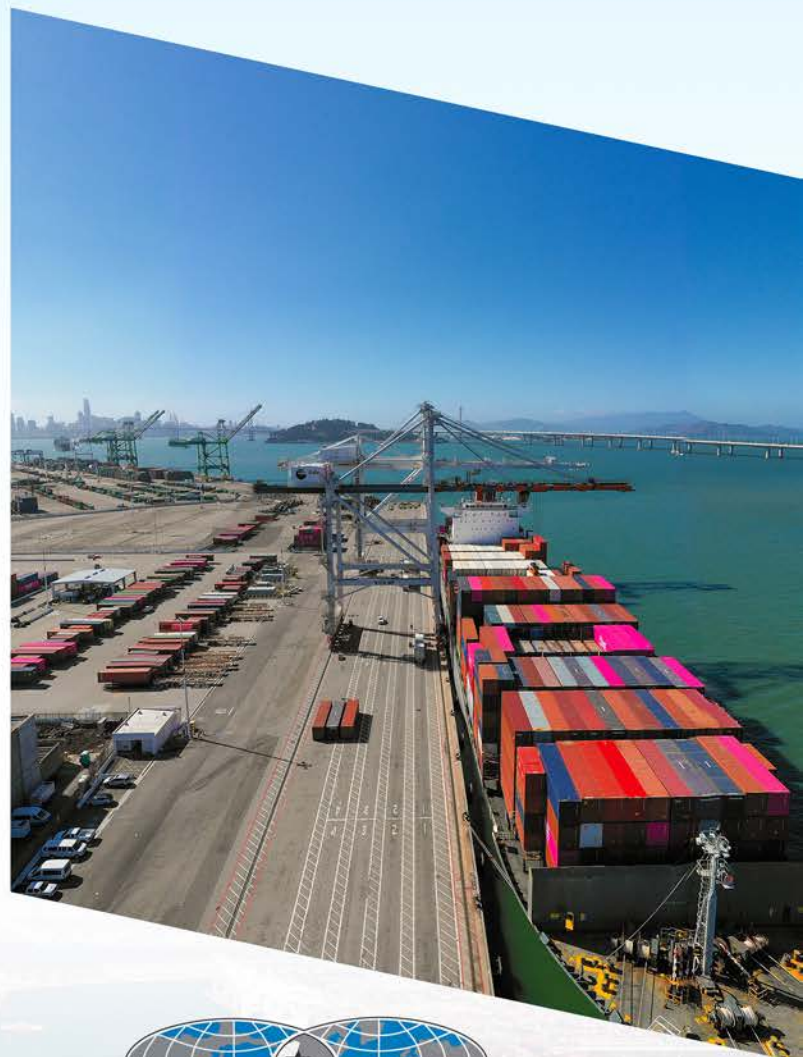
IMPLEMENTING ACTIONS IN THE SEAPORT'S
PATHWAY TO ZERO EMISSIONS PLAN

*FY 2023 PORT INFRASTRUCTURE
DEVELOPMENT PROGRAM (PIDP) GRANT*



SUBMITTED TO
U.S. DEPARTMENT OF
TRANSPORTATION -
MARITIME ADMINISTRATION

SUBMITTED BY
PORT OF OAKLAND
530 WATER STREET
OAKLAND, CA 94607



PORT OF OAKLAND



APRIL 28, 2023

Introductory Information—Cover Page

Name of lead applicant	Port of Oakland
Is the applicant applying as a lead applicant with any joint applicants?	Yes, TraPac, LLC
Project name	Partnering on a Resiliency Solution for Seaport Emissions: Implementing Actions in the Seaport's Pathway to Zero Emissions Plan
Project description	The Port of Oakland, in partnership with terminal operator TraPac, LLC, proposes to purchase ten (10) battery energy storage system (BESS) containers and replace existing diesel fueled cargo handling equipment with seven (7) electric top handlers and 26 electric yard tractors. The project will help the TraPac terminal get closer to its goal of zero emissions equipment by 2035, improve operational efficiencies, provide resiliency to the terminal in the event of a power outage, minimize peak grid use and demand cost charges, and reduce its emissions impact on Port workers and the neighboring historically disadvantaged community of West Oakland.
Is this a planning project?	No
Is this a project at a coastal, Great Lakes, or inland river port?	Coastal
Is this project located in a noncontiguous State or U.S. territory?	No
GIS Coordinates (in Latitude and Longitude format)	37.80840 N, 122.32445 W
Is this project in an urban or rural area?	Urban area
Project Zip Code	94607
Is the project located in a Historically Disadvantaged Community (HDC) or a Community Development Zone (CDZ)? (A CDZ is a Choice Neighborhood, Empowerment Zone, Opportunity Zone, or Promise Zone.)	Yes, Historically Disadvantaged Community (Census Tract 4017) and Opportunity Zone (06001401700)
Has the same project been previously submitted for PIDP funding?	No
Is the applicant applying for other discretionary grant programs in 2023 for the same work or related scopes of work?	No

Has the applicant previously received TIGER, BUILD, RAISE, FASTLANE, INFRA or PIDP funding?	Yes—TIGER FY2012, PIDP FY2021 & FY2022
PIDP Grant Amount Requested	\$45,688,474
Total Project Cost	\$57,110,593
Total Federal Funding	\$45,688,474
Total Non-Federal Funding	\$11,422,119
Will RRIF or TIFIA funds be used as part of the project financing?	No

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1 Project Description

1.1 Project Description and Statement of Work

The Port of Oakland (Port) serves as a critical global gateway for the vast and diverse San Francisco Bay Area and Northern California Megaregion, supporting more than 500,000 jobs in 2018 in the State of California,¹ including the economy of the rural Central Valley farming sector, and is the second largest exporting region in the United States (U.S.). It is also the fourth busiest container port on the West Coast and one of the top ten in the U.S. In 2022, approximately 43% of all loaded TEUs are export commodities including recycled paper, nuts, fruit, meat, grains, iron/steel products, and dairy products, with these products often going to markets in Asia, primarily China, Japan, and Korea. The Seaport serves as a primary export gateway for agricultural products from California's Central Valley and supports the economy of the rural farming sector. The Port exported \$13.6 billion in agricultural products in 2022.



The Port of Oakland, in partnership with TraPac, LLC (TraPac), is requesting Port Infrastructure Development Program (PIDP) funds to purchase ten (10) battery energy storage system (BESS) containers and replace seven (7) diesel top handlers (also referred to as 'top picks') and 26 terminal tractors (also referred to as 'utility tractor rigs' or UTRs) with zero emissions electric top handlers and UTRs. In addition to eliminating fossil-fueled cargo-handling equipment, the **Partnering on a Resiliency Solution for Seaport Emissions: Implementing Actions in the Seaport's Pathway to Zero Emissions Plan** (also referred to as the "Project") will deploy charging infrastructure directly integrated into a state-of-the-art energy storage system to reduce energy demand on the grid at peak times,

lower TraPac's future electricity costs, and provide resiliency to the terminal in the event of a power outage.

This Project capitalizes on the Port's engineering experience on successfully constructing large scale electrification projects², as well as EV charging infrastructure projects.³ Furthermore, the Project builds upon a pilot between TraPac and Taylor Machine Works, a Mississippi-based equipment manufacturer, which successfully demonstrated that emissions from even the heaviest pieces of cargo-handling equipment can be eliminated while also demonstrating a cost-efficient, energy storage system for resilient operations. Taylor teamed with EVESCO to build the BESS (see Figure 1). This system is configured to store enough energy to discharge into terminal equipment and to be scalable for higher energy loads simply by adding more containers.

¹ Martin Associates, *The Local and Regional Economic Impacts of the Port of Oakland Seaport*, March 2018.

² <https://www.oaklandseaport.com/development-programs/shore-power/>

³ <https://www.portofoakland.com/press-releases/zero-emissions-truck-project-launches-at-port-of-oakland/>

Figure 1 Sample Battery Energy Storage System (BESS)

Terminal equipment can charge directly from the BESS during peak times with the battery recharging during off-peak hours. This feature will reduce TraPac's electricity demand charges and minimize strain on the grid. Further, the BESS can be programmed to potentially provide power back into the community during a brown-out or power shortage. This Project marks the first-ever deployment of this BESS in large-scale operations on a marine terminal to power the heaviest of cargo-handling equipment loads.

This Project helps improve community health and air quality, minimizes greenhouse gas emissions, and

supports good-paying, unionized seaport and manufacturing jobs. Further, the Project will greatly enhance the terminal's efficiency, safety, and reliability by switching to manually operated zero emissions equipment with state-of-the-art safety features and less maintenance downtime, which effectively translates into 30% more operating hours per equipment per year. Taken together, these components safeguard TraPac's ability to move cargo efficiently, safely, and emissions-free—even during emergencies.

By 2035, TraPac has set a target of net zero emissions at the terminal by transitioning its cargo handling equipment fleet to zero emissions technology. This transition requires careful coordination with many different entities in order to mitigate risk to operations. Top handlers (Figure 2) and UTRs are the

backbones of a terminal yard operation and must operate for long stretches of time and consume a large amount of energy. The energy demand required to use traditional infrastructure to charge this heavy-duty battery electric equipment would place a strain on the electrical distribution grid. Further, any unforeseen power outages could sideline critical pieces of equipment, grinding terminal operations to a halt. Deployment of the BESS technology greatly reduces the impact on the electrical distribution grid, and also provides resiliency during unforeseen power outages.

Figure 2 Battery-Electric Top Handler at the Port of Oakland

This Project provides a path forward for all marine terminals facing the significant challenge of transitioning to zero emissions technology while reducing impacts to the electrical distribution grid. In California, marine terminals are encouraged to become carbon neutral by 2030. However, it is not yet known whether utilities will be able to supply enough power during peak hours to ensure uninterrupted operation. TraPac’s work with Taylor Machine Works has helped to develop a concept for an energy-storage container that could be charged during off-peak hours, and once charged, could supply enough energy to the equipment throughout the day, minimizing demand and impact on the electrical distribution grid. The Port strongly supports this partnership with TraPac both as its landlord and utility provider as the lower peak power demands spikes reduce impacts to the Port utility grid.

The **Partnering on a Resiliency Solution for Seaport Emissions Project** is in the preliminary engineering stage but could be designed, constructed, and operational within 36 months following availability of funding as described in Section 5.0 Project Readiness. The Project meets the PIDP grant eligibility requirements as it is located within the boundary of a port, in a designated Historically Disadvantaged Community and Opportunity Zone. It supports the program’s goals of improving: the safety, efficiency, and reliability of loading and unloading of goods at the port; the movement of goods into, out of, around, and within the Port; the Port’s resiliency; and reduces environmental and emissions impacts.

Project benefits include:

- Reduced emissions and improved operational efficiencies
- Improved community health and air quality
- Advancing State and Port zero emissions equipment and operations goals
- Energy and fuel costs savings
- Maintenance costs savings
- Supports Port reliability and resiliency
- Benefit-cost ratio of 1.7

Table 1 contains a summary of the key project components and statement of work. Figure 3 presents the anticipated location for the BESS and the infrastructure improvements.

Table 1 Key Project Components and Statement of Work

Component	Units	Statement of Work
Zero emissions top handlers	7	TraPac will purchase seven human-operated, battery-electric top handlers. The equipment will be deployed in 2027. The top handlers will be second-generation battery-electric top handlers with nearly 1MWh of onboard energy storage, which enables 16 hours of operation at about 26 lifts per hour. It will take the top handlers 5 hours to fully charge from a 10% state of charge.
Zero emissions yard tractors (also known as yard trucks or utility tractor rigs/UTR)	26	TraPac will purchase 26 human-operated electric UTRs. The equipment will be deployed in 2027. The performance of new generation terminal tractors models is the fact they have an electric motor that is comparable with that of a diesel engine and can be equipped with large batteries (for example, 222 kWh), offering a significantly greater operating range. Additionally, new battery technology can be operated in a variety of temperature conditions due to improved onboard thermal management.

Component	Units	Statement of Work
Battery energy storage system (BESS)	10	TraPac will procure ten innovative containerized battery energy storage systems (see Figure 1). The equipment provider will provide a modular “plug and play” battery system in a 20’ container (stackable). There will be 5’ modular attachments on either end with two pre-installed charging units at each end, each with two dispensers (for a total of 4 chargers for each BESS). Each BESS will provide 2.1 MWh, enabling the simultaneous charging of four top handlers or six UTRs plus one top handler or similar combinations. Each BESS is designed to work with any electric vehicle charger using a standard CCS1 connector. Using the standard connector will enable TraPac to deploy more electric equipment in the future without fear of compatibility issues. This project marks the first time that BESS containers have been deployed on a large scale at a container marine terminal, and will serve as an important demonstration case for other terminals as they proceed in their own electrification efforts.
Charging hardware and other infrastructure improvements	40 chargers	TraPac will install direct-current fast charger (DCFC) charging infrastructure to the BESS units (4 chargers per unit) to support the seven electric top handlers and 26 electric UTRs, as well as other supporting infrastructure improvements. This work requires utility trenching and installing new conduit, equipment pads, and related power supply equipment such as switchgear and panelboards. A detailed listing of improvements can be found in the cost estimate in the Benefit-Cost Analysis spreadsheet (Appendix B) in the Infrastructure Capital Costs worksheet.

1.2 Challenges Addressed by the Project

Emissions/Disadvantaged Communities. This project is located within federally designated Historically Disadvantaged Community and Opportunity Zone areas (see Section 2.2). The Port and neighboring communities experience some of the highest levels of air quality pollution in the Bay Area according to the Bay Area Air Quality Management District (BAAQMD) and have been identified as a priority Assembly Bill (AB) 617 Community Health Protection Program area, and are included in the Metropolitan Transportation Commission’s (MTC) Equity Priority Communities effort representing census tracts that have a significant concentration of underserved populations, such as households with low incomes and people of color. Over 90 percent of the cancer risk from local air pollution in the adjacent West Oakland is attributable to diesel particulate matter.⁴ Residents also experience higher rates of deaths from cancer, heart disease and strokes, and higher rates of asthma emergency visits and hospitalizations. The Port has been working together with the BAAQMD, West Oakland Environmental Indicators Project (WOEIP), California Air Resources Board (CARB) the freight community, and local community for over 15 years to improve air quality and support public health through major investments, innovation, and commitment. The Port’s plan for emissions reductions, [Seaport Air Quality 2020 and Beyond Plan, The Pathway to Zero Emissions](#), (also referred to as the “2020 and Beyond Plan”) addresses long-term planning for air quality, including the State’s GHG emissions reductions targets, with extensive community and partner engagement.

⁴ West Oakland Environmental Indicators Project and BAAQMD, [Owning Our Air: The West Oakland Community Action Plan](#), 2019 (page 2-3).

Figure 3 Concept Diagram for BESS Locations and Infrastructure Improvements



The **Partnering on a Resiliency Solution for Seaport Emissions Project** (zero emissions cargo handling equipment, battery storage) implements actions in the Plan by procuring zero emissions equipment and operations, which is essential to decarbonizing the Port and delivering related air quality, community health, and jobs benefits.

1.3 Historical Context

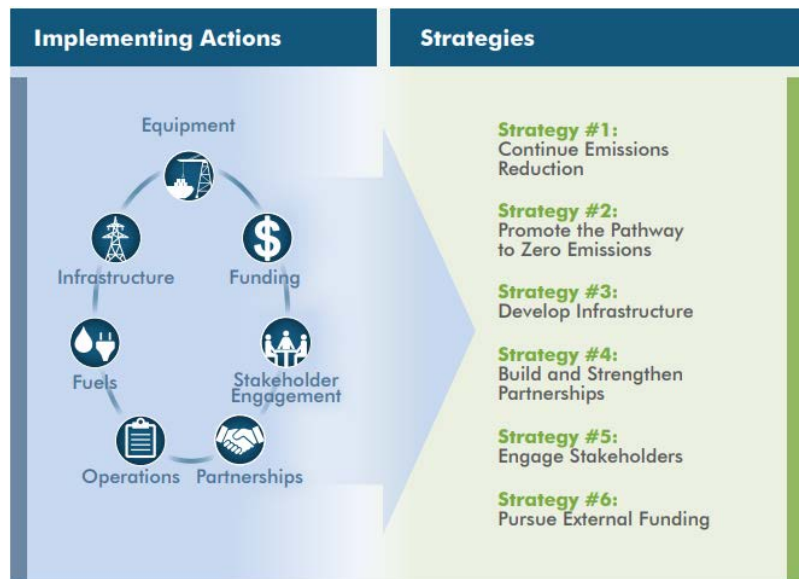
Port of Oakland and the Seaport Air Quality 2020 and Beyond Plan: The Pathway to Zero Emissions

Internal combustion engines, burning fossil fuels (diesel and gasoline), that power trucks, locomotives, ships, and cargo handling equipment are major contributors to emissions of particulate matter, nitrogen oxides, sulfur oxides and carbon dioxide. The California ports are the single largest atmospheric polluters in the State. Exposure to these emissions near ports and railyards is associated with health concerns and eventually serious health problems, especially in communities surrounding ports. Many of those communities are historically disadvantaged.

Effectively addressing the environmental and health concerns caused by emissions of particulate matter, nitrogen oxides, sulfur oxides and carbon dioxide entails the conversion of fossil-fueled cargo handling equipment and vehicles operating at ports, railyards and distribution centers to zero emissions equipment and vehicles. To address these concerns for the Port of Oakland and its surrounding communities, in 2019 the Port formalized its commitment to becoming a zero emissions Seaport by adopting the *Seaport Air Quality 2020 and Beyond Plan: The Pathway to Zero Emissions*.⁵ The **Partnering on a Resiliency Solution for Seaport Emissions Project** directly addresses key implementing actions in the *2020 and Beyond Plan* to expand the Port's

zero and near-zero emissions equipment, especially the plan's intermediate-term actions to deploy 44 pieces of zero emissions cargo-handling equipment and infrastructure to support deployment of zero emissions equipment (#I-1 and #I-3). More generally, this Project also advances two of the plan's six guiding Strategies—Strategy #1: Continue Emissions Reduction and Strategy #2: Promote the Pathway to Zero Emissions—as shown in the image to the right (Figure 4). This Project also builds upon the 2021 Powering the Future PIDP grant, which is implementing other actions from the *2020 and Beyond Plan*.⁶

Figure 4 2020 and Beyond Plan Strategies



Sources: Port of Oakland 2019

⁵ Port of Oakland, [Seaport Air Quality 2020 and Beyond Plan](#), *The Pathway to Zero Emissions*, 2019.

⁶ Port of Oakland, [Powering the Future Project, FY 2021 PIDP](#).

In addition to the *2020 and Beyond Plan*, the Port of Oakland recently approved an environmental ordinance in March 2023 that will require all tenants operating cargo-handling equipment (CHE) to create a plan for converting CHE to zero emissions equipment.⁷ These plans must be developed by the end of 2023. This project will directly support the implementation of this ordinance for its tenant TraPac, who is proactively pursuing ways to not only plan for but also deploy zero emissions CHE.

TraPac

The TraPac Terminal at the Port of Oakland currently has 100 fossil-fueled cargo handling equipment assets that move cargo. Each piece of equipment is used from 500 to 3,000 hours per year and the equipment model years range from 2008 to 2022, averaging to approximately 7 years old. Most of this equipment could be utilized 10 more years if properly maintained. The terminal is currently retrofitting some of its existing rubber-tired gantry cranes (RTGs) with hybrid technology which will reduce emissions significantly due to the ability to capture and reuse energy with the modern, cleaner, and smaller engine.

With this Project, one third of the current fossil fueled equipment fleet will be transitioned to zero emissions technology earlier than expected and provide significant emissions reductions as quickly as possible, reducing emissions and adverse health impacts on the adjacent historically disadvantaged communities. In addition, the manually operated electric equipment will not displace labor. Procuring the ten (10) BESS containers will not only provide resiliency, but also accelerate the Project as needed infrastructure upgrades to the electrical distribution grid will be significantly reduced. TraPac's vision is for its entire equipment fleet to transition to zero emissions by 2035. This project will set in motion the terminal's vision and help provide charging for future equipment and terminal vehicles as the 10 BESS containers can provide additional charging for other zero emissions equipment beyond what is planned to be procured with this grant request.

Support for Other State, Regional, and Local Plans

In addition to the Port's *Seaport Air Quality 2020 and Beyond Plan: The Pathway to Zero Emissions*, the Project supports or is consistent with strategies or projects in multiple State, regional, or local plans. Some examples include:

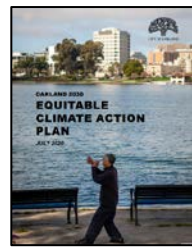
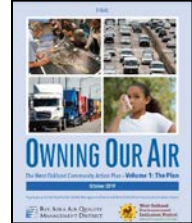
- California State Transportation Agency (CalSTA) and California State Department of Transportation (Caltrans), *California Freight Mobility Plan 2020*, 2020⁸
 - BA_004 Equipment-based reduction projects, upgrades to zero or near-zero emissions equipment including yard trucks and top-picks.
 - BA_007 Marine terminal modernization, including LED lighting upgrades. Reduces the Port's carbon footprint and helps the Region/State move towards achieving its zero emissions goal.
 - BA_008 Port wide electrification, upgrading electrical infrastructure at the Port to increase capacity needed to accommodate the electrification of terminals and equipment.



⁷ <https://www.portoakland.com/press-releases/port-of-oakland-calls-for-zero-emissions-cargo-handling-plans/>.

⁸ <https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/strategic-freight-planning/cfmp-2020> (page 497-498).

- Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG), *Plan Bay Area 2050*, 2021⁹
 - EN8. Expand clean vehicle initiatives with investment in chargers.
 - T2. Supporting community-led transportation enhancements in Equity Priority Communities.
- West Oakland Environmental Indicators Project (community-based organization) and Bay Area Quality Management District's (BAAQMD), *Owning Our Air: The West Oakland Community Action Plan*, 2019¹⁰
 - #18 Air District advocates for more electrical infrastructure and power storage, including truck charging stations.
 - #19 Port of Oakland infrastructure plan to remove barriers to adoption of zero emissions trucks, such as cost, land, and ownership of charging equipment.
- City of Oakland, *Oakland 2030 Equitable Climate Action Plan*, 2020¹¹
 - P-1: Reduce emissions from Port vehicles and equipment, including cargo handling equipment and yard trucks.



1.4 Joint Application Information

The Port of Oakland will be the lead applicant, will administer the grant funding, provide engineering support, and utilities coordination should the Project be awarded. TraPac will lead implementation of the project, including design, bid, and procurement of the equipment. TraPac will be responsible for the PIDP-specific terms and conditions, including meeting Build America, Buy America requirements. For a detailed description of the roles and responsibilities between the Port and TraPac, please see the Memorandum of Understanding (MOU) included in Appendix D.

2 Project Location

2.1 Project Location

The coastal Port, located in Alameda County within the San Francisco-Oakland urbanized area (3.4 million population)¹², links the San Francisco Bay Area (7.8 million population)¹³, the Northern California Mega-region (12.7 million population)¹⁴, and the interior U.S., to the Pacific Rim and the broader world, providing access to global markets and opportunities for increased trade. The 1,300-acre Port complex includes 770 acres of marine terminals, numerous transload/warehouse companies, and is served by two Class I railroads. The Port's facilities include six marine terminals served by more than 20 major ocean carriers,

⁹ MTC and ABAG, [Plan Bay Area 2050](#), 2021 (Chapters 4 and 5).

¹⁰ WOEIP and BAAQMD, [Owning Our Air: The West Oakland Community Action Plan](#), 2019 (page 6-23 to 6-26).

¹¹ City of Oakland, [Oakland 2030 Equitable Climate Action Plan](#), July 2020, page 121.

¹² Census Reporter, from [U.S. Census Bureau. American Community Survey data](#), 2021 1-year estimates.

¹³ U.S. Census Bureau, [2020 Population and Housing State Data](#), 2021.

¹⁴ Bay Area Council Economic Institute (BACEI), [The Megaregional Case for a New Transbay Rail Crossing \(Report\)](#), 2021 (page 5).

20 deep-water berths equipped with 35 container cranes, and near-dock rail intermodal facilities operated by the UPRR and BNSF Railway.

The **Partnering on a Resiliency Solution for Seaport Emissions Project** is located in the western edge area of the Oakland Seaport (see Figure 5) within the TraPac Terminal. The Port is served by multiple Primary Highway Freight System (PHFS) routes on the National Highway Freight Network (NHFN) that provide connections into and out of the Bay Area, including I-80, I-580, and I-880. Three PHFS intermodal connectors provide access to the Project location including West Grand Avenue/Maritime Street, 7th Street, and Adeline Street/Middle Harbor Road (see Figure 6). The Project Location File Map from the attachment (Appendix F) is presented in Figure 7.

Figure 5 TraPac Terminal Area at the Port of Oakland and Proximity to the Historically Disadvantaged West Oakland Community



Figure 6 Seaport Facilities Map with Port Access Roadways

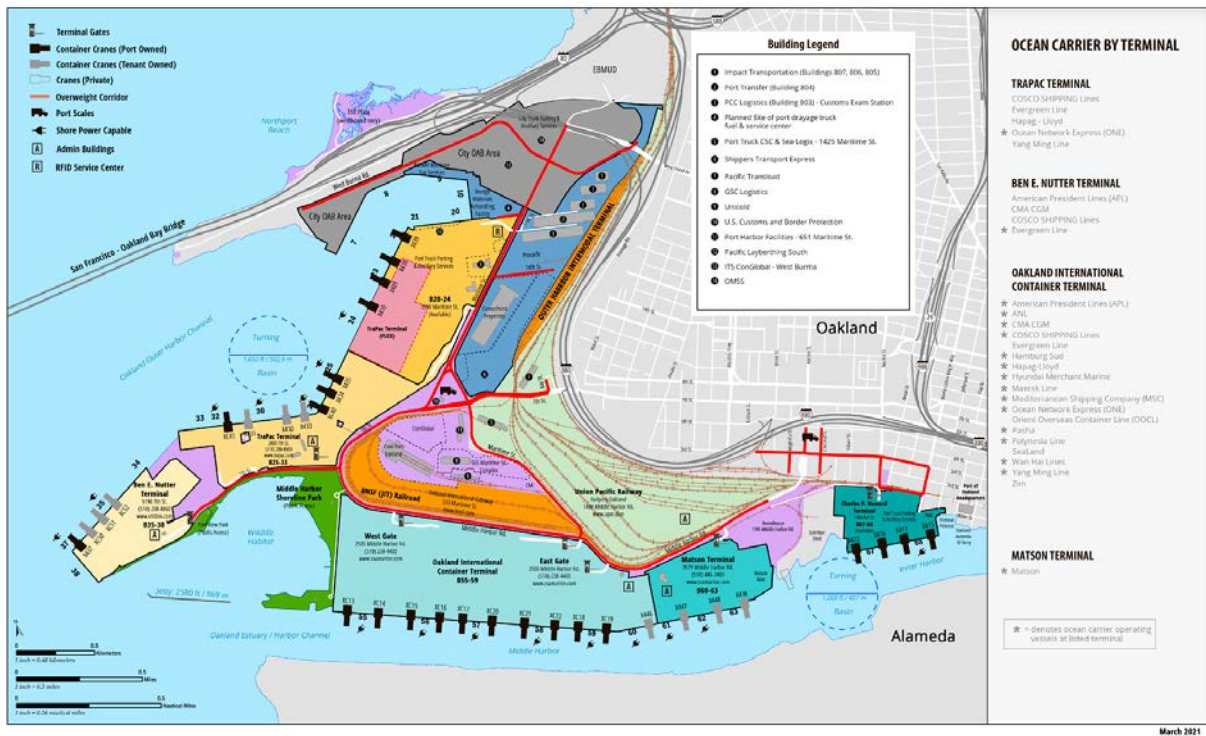


Figure 7 Project Location File Map

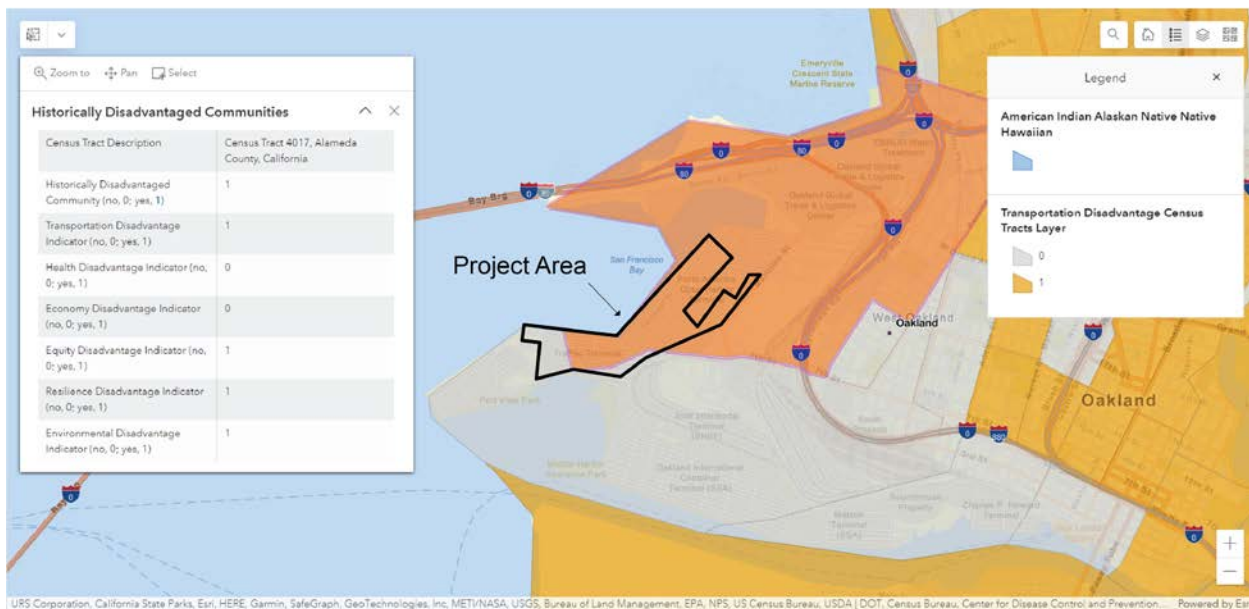


2.2 Federal and Census Designations

The Port of Oakland is a Coastal Seaport located in the San Francisco—Oakland, CA Urbanized Area (Code 78904) based on the 2010 Census-designated urbanized areas. The project is located in a federally designated Historically Disadvantaged Community¹⁵ (Census Tract 4017) and Opportunity Zone¹⁶ (06001401700) (see Figure 8 and Figure 9). As shown in Figure 5, West Oakland is directly adjacent to the Port and experiences a disproportionate burden of Port operations. Figure 10 is an image from the [City of Oakland's Equity Map](#), showing the City designated Priority Neighborhoods. The Priority Neighborhoods are identified by the City using census data to identify the census tracts where the population is most adversely affected by racial and socioeconomic inequity. Census tracts with a proportion of households with limited English proficiency greater than the citywide average (11.9%) are identified with a yellow border. Compared to the City overall, West Oakland has a greater proportion of its population that belong to the following demographic groups: People of Color (75%); Low-income Households (50%); People with Disability (15%); Single Parent Families (28%); Severely Rent-Burdened Households (20%); and Low Educational Attainment (60%).¹⁷

The Project will reduce emissions associated with negative health impacts for the neighboring federally and locally Historically Disadvantaged Communities.

Figure 8 Project Area Location Within Historically Disadvantaged Community



¹⁵ <https://usdot.maps.ArcGIS.com/apps/dashboards/d6f90dfcc8b44525b04c7ce748a3674a>.

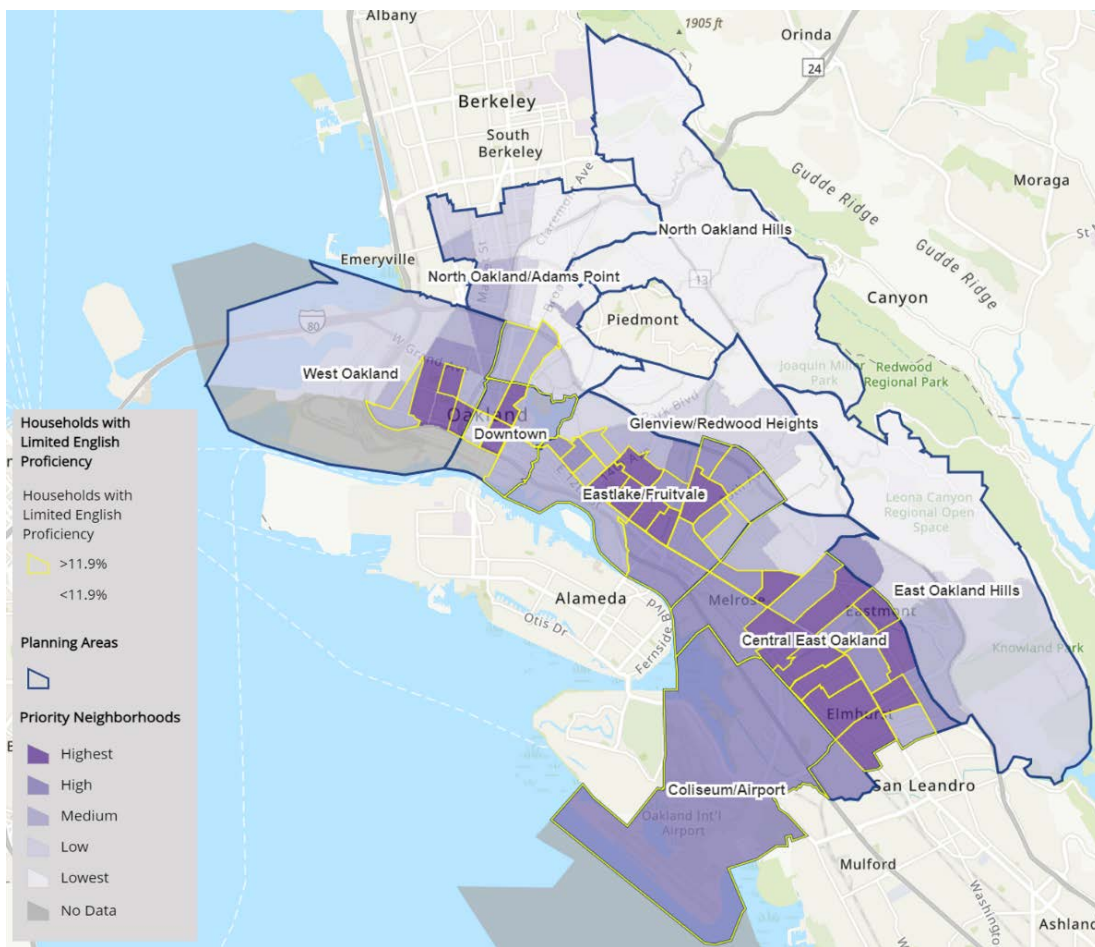
¹⁶ <https://opportunityzones.hud.gov/>.

¹⁷ City of Oakland, [Priority Neighborhoods \(Version 2\)—Geographic Equity Toolbox](#), December 29, 2022.

Figure 9 Project Area Location Within Opportunity Zone



Figure 10 City of Oakland Equity Map



3 Grant Funds, Sources, and Uses of Project Funds

The Project has a total estimated cost of \$57.1 million, of which \$45.7 million is requested from FY2023 PIDP and \$11.4 million will be provided by TraPac and the Port for a non-Federal cost share of 20 percent as required by PIDP. Additional to overall grant funding administration, the Port will be providing \$500,000 in in-kind utilities coordination and engineering support/oversight throughout the duration of the project. The oversight will ensure seamless connection to the Port's substations and electrical infrastructure. While the Port budget is approved annually, the Port already has [Capital Improvement Project \(CIP\)](#) funds for EV charging projects earmarked. There are no conditions on the Port funds, and the funds can be made available from the Port's reserves as soon as Federal grant funds are obligated. The equipment cost estimates below are based on equipment price quotes from a potential equipment manufacturer and preliminary engineering design estimates for construction and engineering to install the BESS containers. The CHE will primarily be operated in census tract 4017 while the BESS and supporting infrastructure in census tract 9819. Costs in Table 2 are presented by component, source of funds, percentage, and census tracts. Detailed budget information is included in the SF-424C form.

Table 2. Project Component Costs and Funding Sources

	Component 1— Zero Emissions Top Picks (Tract 4017)	Component 2— Zero Emissions Yard Tractors (Tract 4017)	Component 3— BESS (Tract 9819)	Component 4— Supporting Infrastructure (Tract 9819)	Total
PIDP Funds	\$11,200,000 (80%)	\$10,400,000 (80%)	\$12,000,000 (80%)	\$12,088,474 (80%)	\$45,688,474 (80%)
Other Federal Funds	\$0 (0%)	\$0 (0%)	\$0 (0%)	\$0 (0%)	\$0 (0%)
Non-Federal Funds	\$2,800,000 (20%)	\$2,600,000 (20%)	\$3,000,000 (20%)	\$3,000,000 (20%)	\$11,422,119 (20%)
Total	\$14,000,000	\$13,000,000	\$15,000,000	\$15,110,593	\$57,110,593

Equipment purchased for this project will be manufactured in the United States in accordance with the requirements of the Build America, Buy America Act (Pub. L. 117-58 Division G, §§ 70901-27), as implemented by MARAD. This is described in greater detail in Section 7 below.

TraPac has made every effort to minimize Project costs. For example, since the BESS containers reduce energy demand, TraPac is able to install the charging infrastructure with less costly upstream electrical upgrades. Also, each BESS container requires only one connection point to the grid, which further contains costs, requiring less infrastructure construction activities since each container is self contained to include not only the battery energy storage system but also the charging equipment.

TraPac has sufficient funds available to contribute the shared costs for the Project. TraPac annually develops a budget for equipment replacement, and those funds have been approved by TraPac's corporate management for use on this Project (see Letter of Commitment—Appendix C). Funding is not contingent on any other condition and may be applied at any time over the course of the Project without restriction.

3.1 PIDP Funding Need

PIDP funding is critical to the **Partnering on a Resiliency Solution for Seaport Emissions Project**. State and local funding programs do not provide nearly the level of investment needed to purchase significant quantities of zero emissions equipment nor do they enable large-scale charging infrastructure installations. State and local programs impose caps on how much funding a single tenant can receive, which precludes large-scale deployment. Further, programs often provide funds for equipment or infrastructure but not both; it is nearly impossible to align access to both equipment and infrastructure funding to move a project forward in an effective manner.

If this Project does not receive PIDP funds, TraPac will be forced to scale back the scope or delay the purchase. The transition to zero emissions would extend into the 2030s, and the deployment and demonstration of the BESS containers would be delayed. Without PIDP funding, the Port and TraPac will not be able to deliver immediate efficiency, air-quality, and climate change improvements for the neighboring historically disadvantaged communities in Oakland, nor will it be able to demonstrate the feasibility of resilient green technology for ports across the Nation.

The Project will be ready to begin once MARAD has obligated the FY2023 PIDP funding. The funding restrictions listed in FY2023 PIDP NOFO have been reviewed and there are no restrictions or ineligibility issues. The \$45.7 million PIDP funding request is well within the dollars to be awarded for projects in a single state. See Section 4.3 Section C: Leveraging Federal Funding to Attract Non-Federal Sources of Infrastructure Investment for additional information.

4 Merit Criteria

4.1 Section A: Achieving Safety, Efficiency, or Reliability Improvements

Safety

The electric top handlers and yard tractors will reduce the risk of worker injuries and fatalities. The new top handlers being considered for the Project come equipped with “Vision Plus,” which provides real-time 360-degree information concerning the location and tracking of pedestrians near the equipment. Vision Plus scans the area around the top handler and issues an audible alert if there is another worker nearby. The equipment manufacturer indicates that up to 36% of forklift-related fatalities involve pedestrians each year, and this new safety feature will reduce the risk of accidental pedestrian collisions, creating a safer environment for longshoremen.

Also, because electric top handlers and yard tractors do not have engines or transmissions, this Project reduces the risk of accidental hazardous-material spills, such as oil and radiator fluids, thereby improving safety for maintenance workers.

Lastly, by reducing particulate-matter emissions, which increase the risk of acute asthma and respiratory attacks, the electric top handlers and yard tractors will improve health safety for operators and bystanders on the terminal. These health benefits further accrue other Port workers and the nearby residents and businesses, most of which are located in historically disadvantaged communities.

Efficiency

This Project is expected to increase the efficiency and operational capacity of TraPac’s top handler and yard tractor fleet, which also is anticipated to increase terminal productivity and cargo-handling capacity. With no fluids or moving engine parts to maintain on a routine basis, electric equipment costs are assumed

to be approximately 30% lower than diesel-fueled equipment.^{18, 19} The electric CHE have fewer moving parts, which means they require fewer repairs and have a longer lifespan. This can lead to lower maintenance costs and reduced downtime.

Electric cargo handling equipment also has faster acceleration, quicker cycle times, and higher lifting capacity than gasoline-powered equipment.²⁰ Electric cargo handling equipment has small turning radiuses that may make the equipment more maneuverable.²¹ A recent demonstration at a San Bernardino, California railyard found that battery-electric yard tractors achieved 23 “miles per gallon” (converting energy consumption to diesel-gallon-equivalent) compared to five miles per gallon for a diesel yard tractor—a nearly four-fold increase in fuel efficiency. Similar increases can be expected with electric top handlers and UTRs. This efficiency translates to lower operational costs and higher productivity per unit, increasing terminal—and ultimately, systemwide—efficiency and reliability.

Reliability

This Project proposes to modernize part of TraPac’s cargo handling equipment fleet, retiring older diesel equipment and replacing them with new electric top handlers and yard tractors. Older equipment is less reliable and results in more downtime due to unforeseen repairs. By upgrading the fleet to the new zero emissions models, TraPac will increase in-service hours for the top handlers and yard tractors, thus enhancing terminal dependability.

Additionally, TraPac will deploy battery storage to enhance the reliability of the electric equipment. If the power goes out, the BESS can continue to charge the equipment deployed under this Project, enhancing reliability. In addition, the BESS uses a standard CCS1 charge point allowing additional equipment types to charge off the resilient power.

This Project bolsters the Port’s role within the local, regional, and national supply chain. As freight volumes increase, the increased productivity of zero emissions equipment, once commercialized and performing adequately, will help TraPac keep up with increased cargo demands and move cargo more efficiently and reliably on the terminal, which in turn reduces truck queues and roadway congestion.

4.2 Section B: Supporting Economic Vitality at the Regional or National Level

Based on *The Economic Impact of the Port of Oakland* report by Martin Associates (2018), the total economic value of marine cargo and vessel activity at the Port is estimated at \$60.3 billion; supporting approximately 500,000 jobs in the State of California, including 11,393 jobs directly created by Port activities, as well as more than 16,000 induced and indirect jobs in the Bay Area. Modernizing the cargo handling equipment at the TraPac terminal with zero emissions equipment and installation of the BESS and supporting infrastructure at the Port is essential to supporting the economic vitality at the local, regional, and State levels, as well as the national level to handle future growth, as well as provide the necessary infrastructure to support the State’s climate change and resiliency goals.

¹⁸ Tetra Tech, Gladstein, Neandross & Associates, [2021 Update: Feasibility Assessment for Cargo-Handling Equipment](#), San Pedro Bay Ports, 2022 (page 88).

¹⁹ AECOM, [Zero-Emission Cargo-Handling Equipment Feasibility Assessment](#), Port of Oakland, 2022 (page 14).

²⁰ GreenPort, ["Electric terminal tractors on the rise."](#) Winter 2020/2021.

²¹ Toyota, [Electric Forklifts vs Propane Forklifts](#), accessed April 2023.

The benefits of replacing seven existing diesel top handlers and 26 UTRs with electric equipment, along with the 10 containerized battery energy storage systems, results in a benefit cost ratio (BCR) of 1.7. The resulting BCR was determined by following the U.S. DOT's Benefit-Cost Analysis (BCA) Guidance for Discretionary Grant Programs. The net capital costs are lower than the benefits, which includes emissions and health benefits, energy use, fuel savings, maintenance savings, infrastructure residual benefit, and the reduced electricity costs owing to lower demand charges and off-peak charging from the BESS containers. The detailed BCA spreadsheet is contained in Appendix B and the BCA narrative is contained in Appendix A.

Additionally, although not quantified, the Project has noise and workforce benefits. Because electric equipment does not have engines, they are much quieter than diesel equipment, thus reducing noise impacts for workers and nearby communities. Further, the Project supports American industry and will result in high-quality job creation by supporting good-paying jobs with a free and fair choice to join a union during equipment manufacturing and operations. See Section 5.3 for additional information.

4.3 Section C: Leveraging Federal Funding to Attract Non-Federal Sources of Infrastructure Investment

This Project leverages PIDP funds with \$11.4 million in private and Port, non-Federal dollars for the seven electric top handlers, 26 electric UTRs and 10 battery energy storage system (BESS) containers and charging infrastructure. The BESS containers will enable TraPac to demonstrate state-of-the-art, innovative technology and will allow it to purchase additional BESS containers and transition the remaining diesel fleet to electric equipment, primarily with non-Federal funds, which further leverages the PIDP investment.

4.4 Section D: Port Resilience

As the Nation transitions to zero emissions cargo handling, the consistency of power availability is a major concern; a power outage could render electric equipment useless, which would hamper cargo movement and the supply chain. This Project addresses this issue by combining work to electrify the Port's grids (including ongoing work to deploy a battery storage system or BESS) with equipment independent of supply chain issues associated with procuring diesel and gasoline. The new equipment will enable the Port to continue operations even in the face of power outages or supply chain shortages, supporting an uninterrupted flow of cargo and more predictable business operations in the face of resource or price fluctuations.

The Project incorporates engineering design and programmatic elements to bolster port resilience in the face of weather, climate-related, and human-caused emergencies, including sea level rise and cyberattacks. It also enhances Port resilience by shifting away from fossil fuels, which are susceptible to supply and price fluctuations. By shifting away from diesel and toward electricity, TraPac will benefit from more stable pricing and energy supply, particularly as the California grid incorporates more renewable energy sources such as wind and solar. Electricity is less expensive than diesel and less subject to volatile price swings and global supply issues. These factors will bolster the terminal's resilience, stabilizing the



long-term business outlook and guarding against fuel-market fluctuations. As part of the BCA analysis, this Project is estimated to reduce diesel fuel use by an average of 184,000 gallons annually over the 15 years by transitioning existing fossil fueled cargo handling equipment to electric.



Alignment with Established State, Local, or Regional Plans

The **Partnering on a Resiliency Solution for Seaport Emissions Project** directly improves climate adaptation and resiliency identified in regional and local climate change adaptation plans. In addition to the five State, regional, and local plans described in Section 1.3 (Port of Oakland's *Seaport Air Quality 2020 and Beyond Plan: The Pathway to Zero Emissions*, California State Transportation Agency (CalSTA) and California State Department of Transportation (Caltrans) *California Freight Mobility Plan 2020*, Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG) *Plan Bay Area 2050*, West Oakland Environmental Indicators Project and Bay Area Quality Management District's (BAAQMD) *Owning Our Air: The West Oakland Community Action Plan (2019)*, and City of Oakland's *Oakland 2030 Equitable Climate Action Plan (2020)*), the Project supports or is consistent with strategies or projects in multiple additional State, regional, or local plans, many of which incorporate resiliency and climate action concepts and techniques.

The City of Oakland 2030 [Equitable Climate Action Plan \(ECAP\) \(2020\)](#) builds on nearly three decades of progressive, science-based policies and programs that the City has pursued to reduce climate impacts and reverse environmental harms. The Project implements the Port actions in the ECAP: P-1 Reduce Emissions from Port Vehicles and Equipment and P-2 Reduce Emissions from Electricity. The Project will support electrification of cargo handling equipment and operational infrastructure with electric storage and charging stations. It will provide backup power and climate resilience to insulate and protect the Port from the impacts of electric power disruptions, including rolling blackouts during heat waves and public safety power shutoffs (PSPS). In addition, power from the BESS has the potential to be fed back to surrounding communities, helping keep essential life-safety functions operational in the neighboring disadvantaged communities (such as cooling centers during extreme heat events).

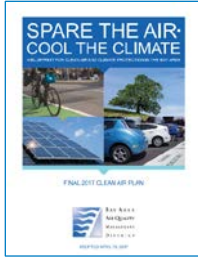
P-1

Reduce Emissions from Port Vehicles and Equipment

Lead Agency	Climate Benefit	Cost	Benefits
Port		\$\$\$\$\$	

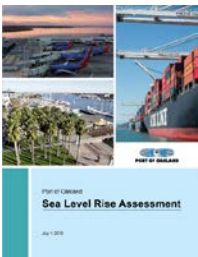
The City of Oakland recommends that the Port Board of Commissioners reduce emissions from Port vehicles and equipment in the following ways:

- By 2022, develop a long-term plan for full electrification of drayage trucks.
- By 2024, develop a zero-emissions transportation master plan for all airport operations.
- By 2022, develop a plan for sufficient electric charging infrastructure for yard trucks and cargo handling equipment.
- Plan electric charging infrastructure as part of a comprehensive backup power and climate resilience effort to insulate the Port of Oakland from the impacts of changing electric power reliability.
- Study the feasibility of renewable diesel in Port sources of GHG emissions as an interim strategy on the pathway to all-electric vehicles.
- Study the effect of the extra weight of battery electric trucks on the City's overweight corridor.
- Work with State and private businesses to develop and review a renewable hydrogen production, storage, and fueling infrastructure pilot project, to the extent no adverse environmental impacts are identified during project-level review.
- Analyze the potential for establishing entry fees for GHG-producing vehicles as a funding source for PEV infrastructure.



The Project also addresses the goals and key priorities of the regional BAAQMD's [Spare the Air Cool the Climate, A Blueprint for Clean Air and Climate Protection in the Bay Area Clean Air Plan \(2017\)](#), developed in collaboration with MTC, the Bay Conservation and Development Commission, and ABAG. The Project improvements will help the Plan's two paramount goals, protecting air quality and health at the Regional and Local Scale and protecting the climate, by helping to advance the State's air quality, emissions, and climate goals, reducing disparities among Bay Area communities in cancer health risk from toxic air contaminants, and reducing GHG emissions through the increased use of electric vehicles and operational infrastructure within and near the Port.

The [Caltrans Climate Change Vulnerability Assessment Summary Report for District 4 \(2018\)](#) recognized that Caltrans District 4 in the San Francisco Bay Area is a major freight hub with major hubs and distribution centers and warehouses with highways that carry some of the highest volumes of trucks in California. The freight system can be particularly vulnerable to disruptions caused by extreme weather events and the Project's resiliency components will help ensure that regional viability will be maintained.



Further, the Port has adopted criteria for evaluating the sustainability of proposed capital projects, including risks posed by a changing climate. To inform considerations of physical asset vulnerability and pathways to climate adaptation, in addition to being responsive to Assembly Bill 691, the Port of Oakland conducted a [Sea Level Rise Assessment](#). The Port will soon be undertaking an additional sea level rise and groundwater study to further understand potential asset vulnerabilities, including core electrical infrastructure. These studies and related mapping projects will be used to vet the location of proposed infrastructure improvements as part of the Project, and ensure physical risks to project investments are mitigated to the fullest extent possible. In addition, the Project supports efforts to reduce future sea level rise by reducing GHG emissions through electrification and reduced reliance on carbon-based fuels.

5 Selection Considerations

5.1 Section E: Climate Change and Sustainability

Once implemented, TraPac will have some of the first battery electric equipment fully supported by the energy storage systems in the Nation, demonstrating the feasibility of zero emissions equipment for the heaviest types of cargo-handling equipment, while also including resiliency components.

In addition to recent efforts to reduce the Port's impact on climate and contribution to a sustainable future, this Project builds on successful efforts among many California ports, including the Port of Los Angeles and the Port of Long Beach, contributing to more durable and systemic improvements with respect to climate change. This project supports statewide efforts to engage ports as critical stakeholders in advancing climate change objectives, including those outlined in the [California Zero Emission Vehicle Market Development Strategy](#) that identifies ports' unique opportunity to scale the Zero Emission Vehicle Market. This builds on lessons learned from demonstrating zero emissions cargo handling equipment, including two (2) top picks at the Port of Oakland trucking tenant Shippers Transport Express (STE). The success of this Project will support electrification across all of the Nation's seaports, accelerating durable, systemic improvements with respect to climate change, sustainability, and environmental justice.

This Project significantly reduces greenhouse gas emissions and air pollutants and improves health for nearby environmental-justice and disadvantaged communities. According to the [2020 Port of Oakland Emissions Inventory Report](#), container handling equipment is responsible for directly contributing 21,616 metric tons of CO₂-equivalent (CO₂e) emissions per year. The equipment also emits approximately 124.03 tons of oxides of nitrogen (NO_x), 53.74 tons of carbon monoxide (CO), and other emissions. This Project is estimated to reduce greenhouse gas emissions (represented as CO₂), nitrogen oxides (NO_x) and particulate-matter (PM_{2.5}) as shown in Table 3, the latter of which is linked to disproportionate health impacts on nearby environmental-justice and historically disadvantaged communities. The Project is also estimated to result in an average of 184,000 gallons of diesel fuel use reduced annually by transitioning existing fossil fueled equipment to electric, the equivalent of approximately 2,300 acres of forests carbon sequestration in one year.

Table 3 Estimated Lifecycle (15 Year) Emissions Reductions from Project (in metric tons)

CO ₂	NO _x	SO _x	PM _{2.5}
29,478	319	1	32.07

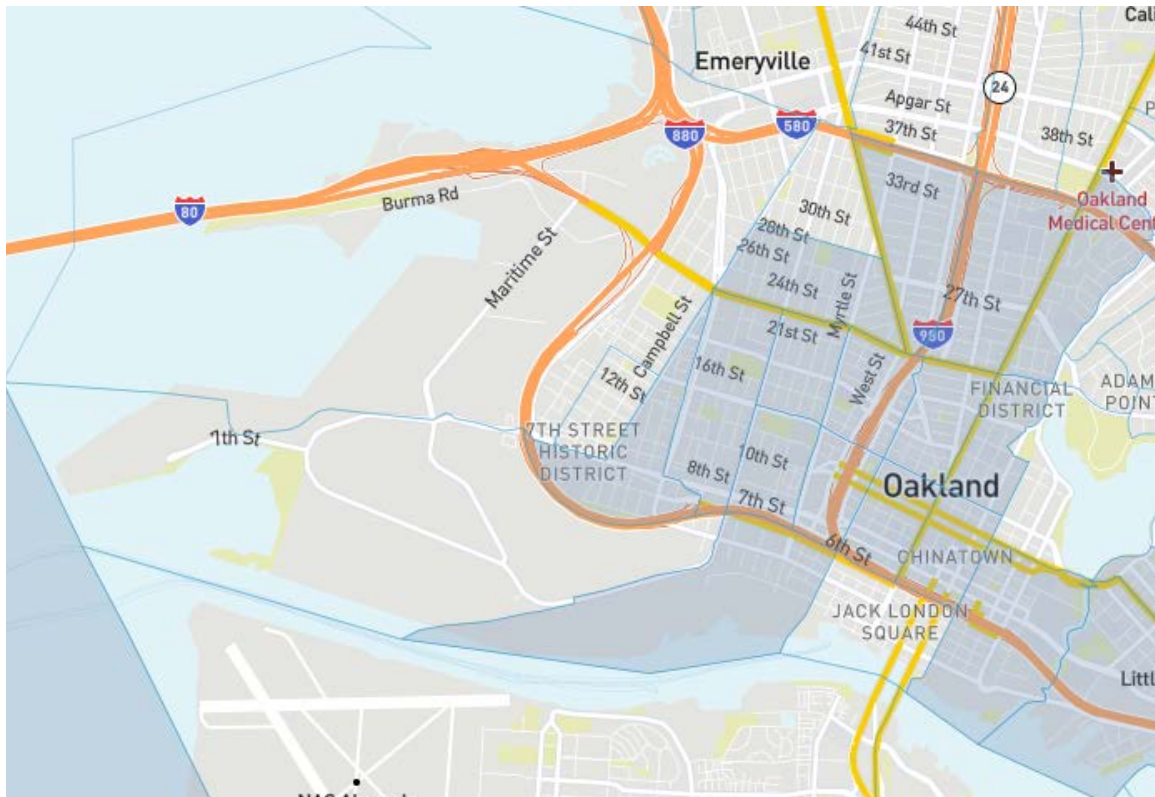
As described in Sections 1.3 and 4.4, the **Partnering on a Resiliency Solution for Seaport Emissions Project** is incorporated within and/or consistent with several State, regional, and local climate action plans related to climate change, sustainability, and environmental justice including:

- Port of Oakland [Seaport Air Quality 2020 and Beyond Plan: The Pathway to Zero Emissions](#) (2019)
- CalSTA and Caltrans [California Freight Mobility Plan 2020](#) (2020)
- Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG) [Plan Bay Area 2050](#) (2021)
- BAAQMD [Owning Our Air: The West Oakland Community Action Plan](#) (2019)
- City of Oakland [Oakland 2030 Equitable Climate Action Plan](#) (2020)
- BAAQMD [Spare the Air Cool the Climate, A Blueprint for Clean Air and Climate Protection in the Bay Area Clean Air Plan](#) (2017)
- Caltrans [Climate Change Vulnerability Assessment Summary Report](#) for District 4 (2018)
- Port of Oakland's [Sea Level Rise Assessment](#) (2019)

With respect to environmental justice, Council on Environmental Quality (CEQ) Climate and Economic Justice Screening Tool (CEJST)²² identifies locations as disadvantaged when it meets more than one burden threshold along with a socioeconomic threshold. Many of the tracts in the adjacent West Oakland community as shown in Figure 11 have been identified as disadvantaged on the basis of low income (people in households less than or equal twice the Federal poverty level), along with projected flood risk, proximity to PM_{2.5}, areas of historic underinvestment (i.e., areas that have historically had high barriers to accessing home loans), proximity to hazardous waste facilities, traffic proximity and volume, underground storage tanks and releases, linguistic isolation, and unemployment. This Project will reduce the Port-related transportation impacts and disparities to the population in these areas with the transition from diesel fueled to zero emissions cargo handling equipment.

²² Council on Environmental Quality, [Climate and Economic Justice Screening Tool](#), November 2022.

Figure 11 Climate and Economic Justice Screening Tool Disadvantaged Communities



The Port has conducted extensive public engagement to incorporate neighboring, mostly historically disadvantaged, West Oakland community needs into their projects and continues to work with local community members, businesses, and a multitude of stakeholders via public information meetings, consultations, social media outreach, Task Force meetings, and other forms of stakeholder engagement. West Oakland, adjacent to the Port, is considered an environmental justice community and is designated by CARB under [Assembly Bill 617](#) as a community bearing a disproportionate air quality burden. Throughout the development of the Port's [2020 and Beyond Plan](#), the community has been clear in its desire to see a complete changeover to zero emissions trucks and cargo-handling equipment for Port-related activities and has requested the Port to take a leadership role in developing the infrastructure necessary to enable the transition to zero emissions and reduce diesel particulate matter (DPM) emissions from Port operations. The local community has also expressed its desire to see generation of power from renewable resources in the Port area to ensure more resilient and clean energy operations in the event of power disruptions occurring outside of the Port's jurisdiction. Public engagement activities were performed during the development of the plan and engagement will continue through all implementation phases. Details on public engagement and outreach can be found in the *Plan's* [Public Engagement Plan](#).

The Port has also collaborated with the local community and the City of Oakland with public engagement activities for numerous other efforts including the [West Oakland Community Action Plan \(WOCAP\)](#). The **Partnering on a Resiliency Solution for Seaport Emissions Project** supports strategies in the WOCAP and implements actions in the Port's *2020 and Beyond Plan* including charging equipment, transition to zero emissions drayage truck operations, use of grants and incentive funding to replace or convert existing CHE and drayage trucks to zero emissions or hybrid equipment, and investing in upgrades to the Port's infrastructure to support the above stated goals.

5.2 Section F: Equity and Justice⁴⁰

Equity is at the forefront of this Project. Once implemented, this Project will improve environmental health and air quality in communities that have been disproportionately impacted by Port operations. It also supports equitable distribution of workforce benefits by using human-operated (non-automated) equipment, which maintains good-paying longshore union jobs, and by investing in unionized manufacturing jobs here in the United States.

This Project primarily benefits the disadvantaged environmental-justice communities directly adjacent to the Port by reducing air emissions, thereby reversing historical inequities and preventing future ones. All of the components of the Project are implementing actions under the Port's *2020 and Beyond Plan* and subject to the public engagement activities as part of the original plan development as well as during implementation as described in Section 5.1 above. During the development of this application, the Port and TraPac met with staff from Earthjustice, a nonprofit public interest environmental law organization, and the West Oakland Environmental Indicators Project (WOEIP), a resident led, community-based environmental justice organization dedicated to achieving healthy homes, healthy jobs and healthy neighborhoods for all who live, work, learn and play in West Oakland, regarding the proposed Project. An outcome of that effort is for the Port to explore opportunities to work with the community-based organizations (CBOs) to identify West Oakland EV charging and BESS needs and locations, determine appropriate technology options, and collaborate with other potential partners, such as the City of Oakland, to pursue upcoming Federal and/or State grant opportunities.

In addition to its direct engagement with stakeholders in the community, the Port of Oakland implements best practices to ensure its activities are fully compliant with Title VI of the Civil Rights Act of 1964 and other equal access laws. The Port of Oakland's outreach strategies include, but are not limited to:

- Reasonable public access to technical and policy information.
- Adequate public notice of public involvement activities and time for public review and comment at key decision points.
- Concerted efforts to involve the public, especially those traditionally underserved by existing programs or plans including but not limited to low-income and minority households.
- Coordination of planning processes, especially where multiple levels of oversight exist, public processes to enhance public consideration of the issues, plans and programs and reduce redundancies and cost.
- Ensure opportunity for full participation of Limited English Proficiency (LEP) speakers through provision of language interpretation services.
- Ensure opportunity of full participation of persons with disabilities by providing reasonable accommodations.

5.3 Section G: Workforce Development, Job Quality, and Wealth Creation

The Port continues to increase its importance in the local economy as a major source of job creation. This underscores the importance of the Seaport as a major economic catalyst in the Bay Area, Northern California, and the State of California economies. To sustain this growth as an economic engine, it is critical that the Seaport and the region continue to invest in Port infrastructure and equipment to meet future demand and continue to attract tenants to stimulate further economic development. The future growth of the Seaport will result in further job, income, and tax growth for the region and State.

The Port has and continues to advance workforce opportunities and equity. This section describes the workforce development, job quality, and wealth creation aspects of this Project, followed by the Port's ongoing practices that apply to this Project as well as all work done by the Port.

This Project

The majority of Federal funds requested for the **Partnering on a Resiliency Solution for Seaport Emissions Project** will go toward the equipment itself, not infrastructure/construction, and as such, the Port and TraPac have prioritized union labor for equipment manufacturing and deployment rather than for construction, which is a relatively short-term investment.

As noted previously, TraPac plans to purchase non-automated, human-operated top handlers, and there will be no worker displacement as a result of the equipment deployment. Once deployed, the equipment will be operated, charged, and maintained by members of the ILWU, supporting good-paying union jobs. The equipment dealers and/or manufacturers will provide workforce training to charge, operate, and maintain the equipment. Further, it is anticipated the top handlers will be manufactured in the United States by members of the Steelworkers Union, which helps to support good-paying unionized manufacturing jobs. Potential equipment vendors utilize workers from the local community, where nearly 50% of the residents are African American and 22% of residents fall below the Federal poverty line.

Ongoing Workforce Development and Equity Practices

The Port consistently reviews its policies and strategies to ensure local communities have access to opportunities provided by Port projects, supporting racial equity and reducing barriers to opportunities for neighboring disadvantaged communities. Port initiatives and staff specifically monitor and address:

- Compliance with state and Federal wage rate requirements.
- Employment and equal opportunity complaints.
- Job creation (especially for economically distressed areas).
- Local hours and apprenticeship goals.
- Environmental health, safety, and justice concerns (especially as they affect traditionally marginalized communities).
- Port's Living Wage Policy: The Port living wage is an hourly wage level adopted by some local governments that set wages at a higher level than the local, Federal and/or state minimum wage.
- Port's MAPLA: MAPLA is an agreement between the Port of Oakland and the Alameda Building and Construction Trades Council that promotes project stability, construction efficiency and local hiring opportunities on all Port projects over \$150,000 that are a part of the Port's CIP. Contractors are required to pay \$0.30 per work hour into a Social Justice Trust Fund that is used to support local workforce development programs.
- Port's Operations Jobs Policy tenets: (Fair Chance hiring, local hiring preferences/focus on disadvantaged workers and temporary worker protections). In 2017, the Port Commissioners passed an Operations Jobs Policy for the Seaport Logistics Complex with CenterPoint Logistics, Inc. Key aspects of this jobs agreement include living wages and benefits for workers, priority consideration for unemployed individuals, armed forces veterans, single parents, ex-offenders, and foster care adults; and a ban on asking applicants about prior criminal offenses.

- Local, small, and disadvantaged business utilization policies: The Port has bid preferences and goals for including local, small, and disadvantaged businesses on Port projects.

In 2018, the Port hired a Workforce Development manager to support workforce policies and initiatives that expand economic opportunities for local impact area (“LIA”) residents. The LIA (consisting of the Cities of Oakland, Alameda, San Leandro, and Emeryville) encompasses areas most likely to experience benefits and adverse effects of Port operations. The Port’s Workforce Development Manager is also tasked with strengthening education and training partnerships. The Port adopted a Workforce Development Plan as part of its [2020 and Beyond Plan](#). The Workforce Development Plan includes a framework that allows for growth, change, and innovation to support the pathway to a zero emissions Port while playing a central role in the convening of partners, including state, local, and educational institutions.

The Port has a long history of implementing programs, policies, and initiatives that promote access to Port and Port-related careers, with a focus on reaching workers from communities defined as disadvantaged as a central part of the Port’s mission. The Port has been at the forefront in pioneering job creation and access to good paying jobs with an intentional focus on mitigating barriers towards employment since 2000, when the Port adopted the region’s first MAPLA with the Building and Construction Trades in Alameda County (“BTC”). Over the next two decades, the Port continued to strengthen workforce initiatives and policies to increase economic opportunities for disadvantaged workers with a clear focus on diversity, equity, and inclusion.

The MAPLA goals are a target to be achieved and are designed to help reassessment and improvement of local hiring strategies. The Social Justice Committee meets monthly to monitor contractor performance and provide recommendations to assist contractors with achieving their MAPLA requirements. MAPLA also requires construction contractors to contribute into a trust that funds community-based organizations that provide training for construction sector jobs to low-income residents in the Port’s LIA.

In 2016, the Port issued a 5-year extension of MAPLA that included enhanced commitments that doubled the hourly contractor contributions from \$0.15 to \$0.30 cents; over \$590,000 has been awarded to community-based training programs that serve underrepresented job seekers in the Port’s LIA. The Port also strengthened language in MAPLA where the building trades unions commit to increase recruitment from the Port’s LIA into the “list trades” and included goals for disadvantaged workers. The list trades provide access to some of the highest paying jobs in construction. Between 2017 to 2020, over 300 Port LIA residents joined the list trades (composed of sheet metal workers, electricians, plumbers/pipefitters, glaziers, and elevator constructors). MAPLA compliance and tracking is central to ensuring accountability and commitment to serving our LIA residents. Table 4 below is a snapshot of the 2021 achieved goals.

Table 4 2021 MAPLA Achieved Goals

MAPLA Performance	2021 MAPLA (July 2020–June 2021)		
Total Hours Worked	5,834,525		Goal
LIA residents	1,762,468	30.21%	50%
LIA apprentices	3,416,504	58.56%	50%
DW app (new goal)	37,537	21.91%	25%
NHA app (new goal)	32,200		N/A

In 2017, the Port adopted the Operations Jobs Policy (Jobs Policy) that included a Cooperation Agreement focused on equity, access, and good paying jobs on the CenterPoint Landing Project, a warehousing development. The language in the Jobs Policy specifically focuses on local hire preferences, “ban-the-box”

prohibiting employers from asking about prior criminal offenses, special consideration for disadvantaged residents, living wages and benefits for workers, limits on the use of temporary agencies, support to local community-based workforce partners to conduct outreach, recruitment, job training/placement, and the creation of the Jobs and Stakeholder Working Group (“SWG”) to support implementation of the agreement.

The SWG is driven by a vision in which all people of color in Oakland and the East Bay are healthy and thriving economically. This vision is rooted in an understanding of longstanding and racialized social and economic inequities in the region. The SWG recognizes that to get there, the Port and its partners must achieve important outcomes around leadership, equitable hiring, and institutional change. These key factors are important supports to the specific details outlined in the policy.

The SWG includes diverse and engaged local and regional community leaders, including representatives of the Port, its tenants, labor groups, and representatives of local neighborhoods. The SWG serves as an advisory body to the Port. It provides technical expertise, analysis, and recommendations to ensure that Port workforce decisions help transform low-income LIA neighborhoods into stable, healthy, thriving communities of opportunity.

Figure 12 Port of Oakland Operations Jobs Policy Outcome Map



The Port’s Workforce Development manager also coordinates several workforce initiatives, including: an inter-agency project labor agreement (“PLA”) research project in partnership with the San Francisco Foundation called “Improving Effectiveness of PLAs.” The primary focus of this research project is to identify strategies for diversifying the construction workforce through PLAs. Phase I of the research was concluded in early 2021 and through a collaborative stakeholder process performed a scan of PLAs and Community Benefits Agreements nationally; interviewed current and former trade workers representative of Black/Indigenous/Brown People of Color (“BIPOC”) to better understand their lived experiences in the construction industry; conducted a labor demand and supply analysis of the local building trades, apprenticeship and pre-apprenticeship programs; assessed public agencies certified payroll data; reviewed construction demand forecasts; and generated findings supported by the recommendation below.

Table 5 Improving Effectiveness of PLAs Recommendations

No.	Recommendation
1	Set Data-Driven Workforce Goals
2	Establish Clear Responsibilities for Achieving Workforce Goals
3	Collect Data to Track Progress on Workforce Goals
4	Enforce to Ensure Progress on Workforce Goals
5	Support the Retention and Advancement of Diverse Workers
6	Coordinate Ongoing Support for Diverse Workers
7	Collaborate on a Regional Level to Create a Diverse Workforce

Phase 2 of the research project will center on the development of an action and sustainability plan that will prioritize the most effective and efficient implementation of the recommendations. This work is conducted in collaboration with the Port's MAPLA Joint Administrative and Social Justice Committee, an oversight body composed of labor, management, union, and community representatives.

Additional information can be found at the Port's [Social Responsibility Division Programs and Policies](#) webpage.

6 Project Readiness

The Port has extensive experience working with Federal agencies to deliver projects. The funds can easily be obligated and expended within the timeframes desired by DOT, and potential project risks are low.

6.1 A: Technical Capacity

The Project Team has the personnel, knowledge, skills, and expertise necessary to implement this Project on schedule and within budget to ensure the Project's benefits are rapidly realized. In particular, Port engineering and support staff are extremely experienced, having successfully completed an [EV charging project](#) and [electrical infrastructure upgrades](#). Through the Project team's existing relationships and extensive coordination with OEM technology providers and vehicle/equipment manufacturers, freight fleet operators, as well as other project stakeholders, the Project team is fully capable and has the capacity to implement this Project. The Port of Oakland has the commitment from TraPac to meet the non-Federal match funding requirements for this project (Appendix C and Appendix D).

Feasibility and Constructability

The Port does not expect any challenges related to the National Environmental Policy Act (NEPA), Endangered Species Act, or Clean Water Act. The Port and TraPac have extensive experience procuring goods and services in compliance with the Federal Acquisition Regulation and is committed to complying with the Build America, Buy America Act to the maximum extent possible.

The three year Project schedule duration falls well within the PIDP period of performance, which ends five years after the obligation of grants. Assuming notification of PIDP grant award by end of 2023 and executing the Grant Agreement with MARAD and obligate funds in late 2024, the Port and TraPac estimate three years to permit, design, procure the zero emissions equipment and BESS containers, install utilities connection for the BESS, and train union operators and equipment maintenance personnel.

Compliance with Federal Requirements

The Port has a grants coordinator who tracks and manages the requirements of grant funding and works with respective Port project managers to ensure the accurate and timely deliverability of each grant program. The Port of Oakland is in regular compliance with all State and Federal audits of grant funding. The Port's engineering and environmental planning and permitting divisions ensure that each project meets all applicable safety, construction, and environmental requirements.

Project Relationship to Ongoing Planning Efforts

The Project's zero emissions cargo handling equipment, electrical charging infrastructure and battery energy storage system (BESS) are part of ongoing efforts by the Port to improve air quality as a strategic priority and are included as strategies or actions in several local, regional, and State plans. The Port's *2020 and Beyond Plan*, the City of Oakland's *Equitable Climate Action Plan*, and the *West Oakland Community Action Plan* (WOCAP) all call for increased electrification of Port-related vehicles, equipment, and infrastructure. Specific examples include:

- The Port's [2020 and Beyond Plan](#) intermediate-term actions to deploy 44 pieces of zero emissions cargo-handling equipment by 2025 and infrastructure to support deployment of zero emissions equipment (#1-1 and #1-3). Also, two of the plan's six guiding Strategies—Strategy #1: Continue Emissions Reduction and Strategy #2: Promote the Pathway to Zero Emissions.
- Owners of cargo-handling equipment and other off-road equipment operating within West Oakland or at the Port of Oakland voluntarily upgrade to cleaner engines or hybrid and zero emissions drivetrains annually (Strategy #54) in [Owning Our Air: The West Oakland Community Action Plan \(WOCAP\)](#).
- Port of Oakland Actions 1 (Reduce Emissions from Port Vehicles and Equipment) and 2 (Reduce Emissions from Electricity) in the City of Oakland 2030 [Equitable Climate Action Plan \(ECAP\) \(2020\)](#).
- California State Transportation Agency (CalSTA) and California State Department of Transportation (Caltrans), [California Freight Mobility Plan 2020](#), projects BA_004 Equipment-based reduction projects, upgrades to zero or near-zero emissions equipment including yard trucks and top-picks and BA_008 Port wide electrification, upgrading electrical infrastructure at the Port to increase capacity needed to accommodate the electrification of terminals and equipment.

Project Schedule

The estimated project schedule is shown in Figure 13. The Port anticipates being ready for obligation of grant funds by December 31, 2024.

Preconstruction Phase. The Port and TraPac would begin the design process once grant funds have been obligated, estimated for January 2025. The Port will complete California Environmental Quality Act Review and anticipates either Categorical Exemption or an Initial Study-Negative Declaration. The Port anticipates that NEPA review by MARAD would consist of a Categorical Exclusion or Finding of No Significant Impact. A City of Oakland Building Permit and a Port Development Permit will be obtained prior to construction and no other agency approvals will be required. Utility design and coordination would begin approximately three months from project initiation and be complete by month nine.

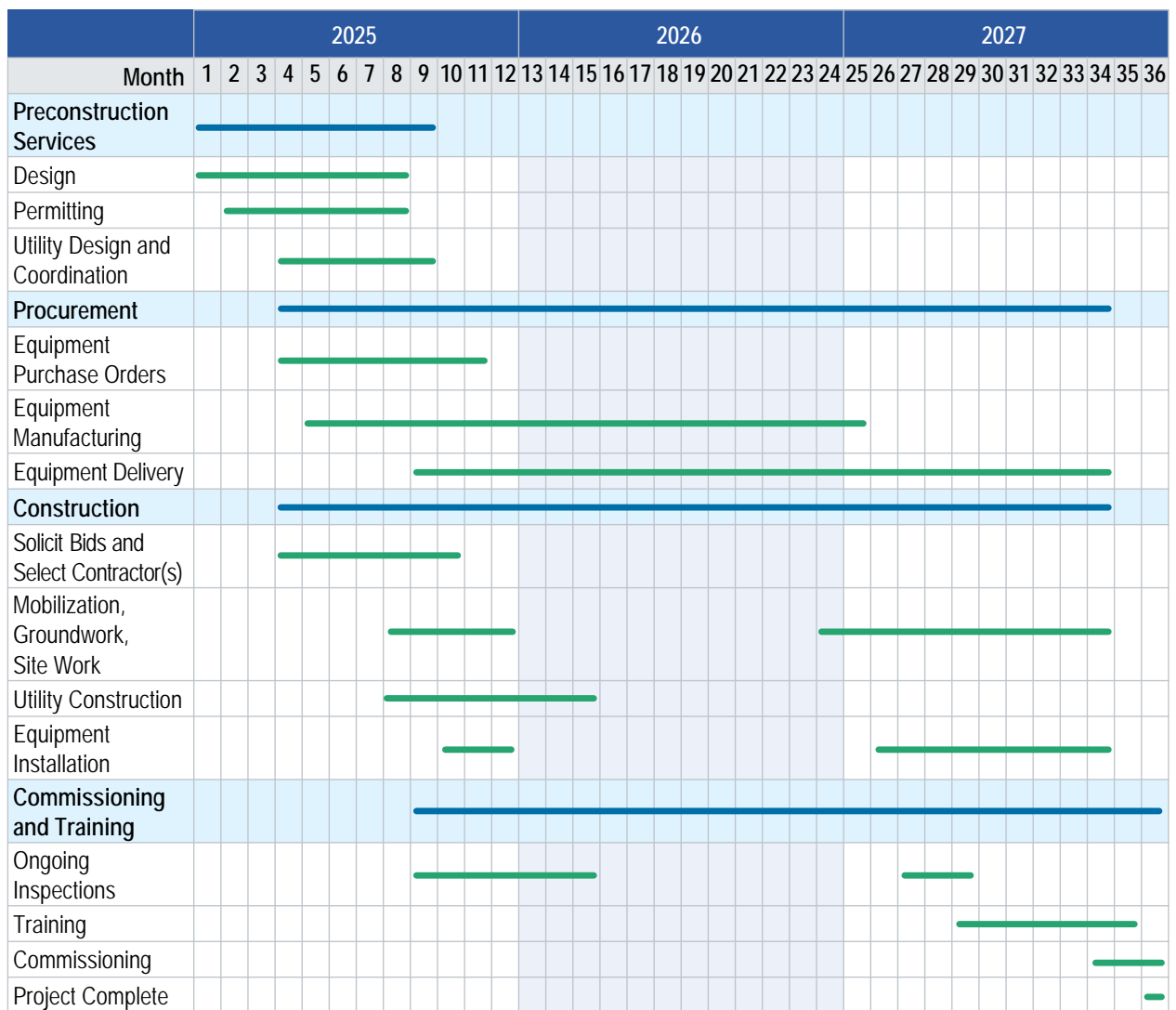
Equipment Procurement Phase. Equipment purchase orders (BESS, top handlers, UTRs, switchgear, charging hardware, etc.) will be made during months four through eleven to ensure time for manufacture and delivery within the three year Project period. The BESS and infrastructure equipment are anticipated to

be delivered within the first year while the top handlers and UTRs in mid-2027. Timeline for manufacture and delivery is subject to change based on conditions at the time of the purchase order.

Construction Phase. Following receipt of construction permits, mobilization and site work would begin. Construction activities related to BESS, charging, and utilities would occur starting in approximately month 8 and end in month 15. Activities related to electrical supply, testing, and final connections and testing would occur towards late 2026 through 2027. Construction sequencing will be further clarified in the design phase.

Commissioning and Training Phase. Inspection activities will occur in months 9 through 15 related to the BESS, charging, and utilities work and again in 2027 for final inspection(s). Training, acceptance, and project closeout activities will occur the last quarter of 2027. The timeline for this phase will be assessed and refined when equipment procurement occurs and updated as needed based on actual delivery dates.

Figure 13 Project Schedule



Risk Mitigation

Potential risks associated with the Project are low and presented in Table 6 with mitigation strategies.

Table 6 Project Risks and Mitigation Strategies

Risk/Constraint	Mitigation Strategies
Unforeseen construction delays due to undocumented underground utilities, unsafe soil, or other types of obstructions discovered during construction	The Port and TraPac will perform additional investigations along major utility alignments and conduct research and ensure adequate contingency budgets to address and mitigate the delay.
Inadequate electrical capacity to support charging-station installations or shore power	The Port and TraPac will initiate formal project request as soon as practical to allow the power company to complete internal studies and define construction timelines.
Construction delays due to the need to perform work on active marine terminals and a rail facility without impacting operations	The Port and TraPac will work closely together to identify mutually acceptable work windows and will develop conservative construction schedules.
Price volatility of construction materials and equipment resulting in higher bids/quotes	TraPac built contingencies in the Project budget for material price increases, conduct regular assessments of equipment costs until the point of ordering to identify potential increases, and place equipment orders as soon as possible.
Zero emissions equipment does not perform equivalently to conventional equipment	TraPac will coordinate with manufacturers to ensure rigorous testing and commissioning protocols to obtain required equipment use certification prior to deployment and documentation of results/lessons learned to inform future demonstrations.

6.2 B: Environmental Risk

The project enjoys broad public support as evidenced by the letters of support included as [Appendix E—Letters of Support](#). The project is not dependent on or affected by any U.S. Army Corps of Engineers (USACE) investment or planning activities.

NEPA and CEQA

The Project team has taken into account potential environmental risks and viable mitigation strategies. Given the nature of the Project, which is the replacement of fossil-fueled equipment with zero emissions equipment and the installation of BESS containers, there are no anticipated, significant environmental risks. Equipment purchases are categorically excluded from NEPA and CEQA. Further, based on similar charging-infrastructure projects of this scale, it is anticipated that construction/installation also is categorically excluded from NEPA and CEQA, although this assumption is subject to further Port review.

Environmental Permits and Reviews

The Project is not expected to trigger any reviews under the Endangered Species Act.

State and Local Approvals

This Project is not expected to trigger any additional state or local approvals.

Project Supporters

- U.S. Senator Dianne Feinstein
- U.S. Representative Barbara Lee
- Oakland Mayor Sheng Thao
- ILWU, Local 34
- Building & Construction Trades Council of Alameda County
- Bay Area Council
- [and more in Appendix E](#)

Reviews, Approvals, and Permits by Other Agencies

Both the Port of Oakland and the City of Oakland will issue building and other construction-related development permits for the project.

7 Domestic Preference

The Project's top handlers, yard tractors, battery-storage systems, batteries, and charging units will be manufactured in the United States. For construction needed to support the charging units, every effort will be made to secure materials produced in the United States. At this time, TraPac does not anticipate a significant need for iron, steel, or other construction materials typically subject to Build America, Buy America requirements, but TraPac will work with its vendors to maximize the use of domestic goods, products, and materials in executing this Project.

8 Statutory Determinations

<p>1. The project improves the safety, efficiency, or reliability of the movement of goods through a port or intermodal connection to the port.</p>	<p>This Project replaces 33 pieces of diesel equipment with battery-electric equipment and 10 containerized BESS, which enhances the terminal's safety, efficiency, productivity, resiliency, and reliability. Specific elements include:</p> <ul style="list-style-type: none"> • State-of-the-art safety monitoring system to reduce/eliminate pedestrian-equipment collisions. • Less maintenance downtime results in more operating hours per unit per year. • Battery storage system increases reliability by enabling equipment operation even during power outages. • The shift away from volatile fossil fuels increases port resilience. • BESS system can be programmed to send power back into the grid during states of emergency. <p>See Section 4.1 for more detailed information.</p>
<p>2. The project is cost effective.</p>	<p>As summarized in Section 4.2 and detailed in the Benefit-Cost Analysis Spreadsheet and Benefit-Cost Analysis and Methodology Report (Appendix B and A), the project has an estimated benefit-cost ratio of 1.7 with net benefits over a 15-year life at \$20.7 million, and therefore is considered cost-effective.</p>
<p>3. The eligible applicant has the authority to carry out the project.</p>	<p>The Port of Oakland is a department of the City of Oakland governed and managed by the Board of Port Commissioners ("Port Board") and its appointed staff. Under the Charter of the City of Oakland ("City Charter"),¹⁸ the Port Board has the "complete and exclusive power":</p> <p><i>"To take charge of, control, and supervise the Port of Oakland, including all the water front properties, and lands adjacent thereto, or under water, structures thereon, and approaches thereto, storage facilities, and other utilities, and all rights and interests belonging thereto, which are now or may hereafter be owned or possessed by the City, including all salt or marsh or tidelands and structures thereon granted to the City in trust by the State of California for the promotion and accommodation of commerce and navigation."</i></p>

	<p>As the above dictates, the Port Board has control over tidelands that were granted to the City by the State of California in trust and/or acquired with trust proceeds (“State Tidelands”). All such State Tidelands and other properties over which the Port Board has control and jurisdiction are referred to as the “Port Area” in the Charter. The Port Area includes the Oakland International Airport, the Seaport, Jack London Square, and (with some exceptions) public lands along the Oakland waterfront. All of the property on which the Project would occur is within the “Port Area.”</p> <p>TraPac has been a tenant in the Port of Oakland for 33 years; entering into a lease agreement with the Port at the current location, 2800 7th Street, Berth 30 in January of 1994. TraPac has since expanded the original 30-acre facility to 123 acres and continues to look into further expansion with the current lease expiring in 2030. With current business prospects, and continued development, TraPac plans to renew their lease in 2030 with additional acreage. TraPac, through its lease agreement and partnership with the Port, has the authority to carry out the Project as proposed.</p>
<p>4. The eligible applicant has sufficient funding available to meet the matching requirements.</p>	<p>As detailed in Section 3, the total estimated cost of the project is \$57.1 million including contingency. TraPac and the Port would fund \$11.4 million (20%) and PIDP \$45.7 million (80%). The Port of Oakland is a financially sound organization with a stable revenue base and a firm financial standing. The Port’s liquidity position, comprised of both unrestricted cash and Board reserves, remains strong and provides the Port the financial flexibility. Port operations are supported by a strong and diverse local economy. The Bay Area continues to be an important center of commerce, and the Port remains an important, key gateway for both domestic and international trade and a top travel destination.</p> <p>TraPac has sufficient funds available to contribute the shared costs for the Project. TraPac annually develops a budget for equipment replacement, and those funds have been approved by TraPac’s corporate management for use on this Project (see Letter of Commitment—Appendix C). Funding is not contingent on any other condition and may be applied at any time over the course of the Project without restriction.</p>
<p>5. The project will be completed without unreasonable delay.</p>	<p>As shown in Figure 13 and discussed in Section 6.1, the Port and TraPac are prepared to move ahead quickly with the project and be ready for obligation of grant funds (i.e., to have obtained all necessary approvals and clearances) by December 2024. Upon notification of grant award, the Port and TraPac would likely complete any necessary resource planning steps needed to facilitate the beginning of design. Overall, the Port anticipates that design, equipment procurement, and construction would be completed within 36 months of grant agreement execution. There are few regulatory approvals that would be required prior to construction.</p>
<p>6. The project cannot be easily and efficiently completed without Federal funding or financial assistance available to the project sponsor.</p>	<p>A project of this magnitude cannot be completed without PIDP funds. If PIDP funds are not received, TraPac would be able to replace only a few pieces of equipment each year, which would greatly extend the overall Project timeline and delay the benefits until mid-2030s. TraPac would need to install charging infrastructure two or three units at a time, which would drive up costs for the total project and potentially impede terminal operations due to constant construction.</p>

Appendices and Attachments

- Appendix A—BCA Narrative – Benefit-Cost Analysis and Methodology Report
- Appendix B—BCA spreadsheet (in an unprotected format)
- Appendix C—Funding commitment letter
- Appendix D—Memorandum of Understanding (MOU)
- Appendix E—[Letters of Support](#)
- SF-424
- SF-424 C
- Project location files