FY 2023 Airport Improvement Program Supplemental Discretionary Grants

Docket No: FAA-2024-1029

Application For:

Achieving Airport Resiliency through Microgrid Implementation

Port of Oakland | Oakland International Airport

PORT OF OAKLAND
Seaport. Airport. Everyone's Port.

May 2024

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Project Summary

Project Title: Airport Resiliency through Microgrid Implementation

Project Sponsor: Port of Oakland, Oakland International Airport

Requested Grant Amount: $20 million

Priority Project Category: C.3.A.3 - Emissions and Energy (EE); Energy Supply, Redundancy and Microgrids

Description: Construction of a new electrical substation and new microgrid. The project will integrate and balance increasing demand loads from airport fleet electrification with battery storage and on-site renewable energy generation to provide resiliency for airport operations, protect the airfield, reduce greenhouse gases (GHGs), expand airport electrical capacity, and preserve electrical capacity for the surrounding community.

Useable Unit of Work: 1) Substation construction and interconnection with electric vehicle (EV) charging stations at Shuttle Bus Charging Depot, 2) Smart electrical distribution infrastructure with a microgrid control system, 3) Connected 780 kW solar array, and 4) Connected 1 MW/4 MWh of battery energy storage system (BESS), each with associated construction and consulting costs.

Scaling Projects: The project units of work above are listed in priority order.

Certainty: The project is critical to the reliability of the Airport's power supply. The Port is already at the 60% design on the substation replacement at the point of interconnection with the PG&E grid, and initiating the procurement of the EV-dedicated substation that is the basis of this Project.

Timeliness of Implementation: The Port has initiated the procurement for the long lead-time equipment for the substations and does not foresee any challenges completing this Project within the timeframes established in the Notice of Funding Opportunity (NOFO).

The Port has solicited letters of support for this project, which demonstrate buy-in and commitment from key stakeholders and provide further evidence of the Port's commitment to completing this project successfully. Letters can be viewed here: www.portofoakland.com/AIP

Executive Order Alignment

Executive Order	How does this project support or advance the goals in the Executive Order?
EO 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis"	The Project aligns with the EO by addressing three key areas. 1) It bolsters resilience to climate change impacts through infrastructure modernization, GHG emissions reduction, and enhanced energy efficiency, 2) It focuses on reducing air pollution, particularly in surrounding environmental justice (EJ) communities, and prioritizes the creation of well-paying union jobs, 3) It incorporates the best available science and seeks input from stakeholders, ensuring evidence-based federal decision-making practices and public engagement.
EO 13985, "Advancing Racial Equity and Support for Underserved Communities Through the Federal Government"	The Project aligns with the EO by advancing equity, civil rights, and equal opportunity, particularly for historically underserved communities. By addressing challenges such as electrical constraints, natural disasters, air quality concerns, and aging infrastructure, the Project promotes energy resilience, reduces GHG emissions, and supports electrification. By generating more electricity on-site, electrical capacity is preserved for surrounding underserved communities. This initiative fosters equitable access to benefits and opportunities, demonstrating a community-based organizations.
EO 14008, "Tackling the Climate Crisis at Home and Abroad"	The Project will modernize infrastructure, reduce GHG emissions, and improve energy efficiency, which enhances resilience to climate change impacts and supports the transition to a sustainable energy future. The Project emphasizes environmental justice by focusing on reducing air pollution in surrounding communities, and prioritizing the creation of well-paying union jobs, aligning with the EO's goals of promoting clean energy and economic growth.
EO 14030, "Climate Related Financial Risk"	The Project aligns with the EO by investing in resilient infrastructure and renewable energy sources, mitigating climate-related risks, and enhancing Federal operations' stability. It supports the goal of achieving a net-zero emissions economy by 2050, contributing to national efforts to reduce GHG emissions. Additionally, it integrates climate-related financial risk considerations into Federal investments, demonstrating a proactive approach to sustainability and resilience.
EO 14036, "Promoting Competition in the American Economy"	The Project aligns with this EO in three ways: 1) It will create jobs and boost economic activity in local communities, thereby aligning with the EO's goal of supporting workers and businesses, 2) Through the implementation of advanced technologies like smart controls and renewable energy, the Project encourages innovation, consistent with the EO's emphasis on technological advancement, 3) The microgrid enhances infrastructure resilience at the Port, enabling U.S. participation in international trade, and ensuring continued operations during emergencies, which aligns with the EO's objective of protecting the economy from disruptions.

Merit Criteria Index: DOT Strategic Framework

How does this project...	Page
Preserve or advance airfield safety standards and the safety of airfield operations?	See Pages 11-12
Incorporate evidence-based resilience and reliability measures for at-risk infrastructure, including measures to prevent or recover from the impacts of increased climate risks?	See Pages 7 and 11
Reduce the lifecycle GHG gas emissions from project materials and airport operations, including steps to make SAF available?	N/A
Reduce emissions associated with airport operations, increases energy efficiency, and supports the ability to incorporate sustainable energy sources?	See Page 11
Comply with the Department of Transportation's Equity Action Plan?	See Pages 12-16

Selection Considerations Index

How does this project...	Page
Enable subsequent projects, such as energy assessments or audits, if applicable?	This project will enable the continued electrification of vehicles, equipment and facilities at OAK by providing sufficient power capacity
Include a plan to measure the impacts of the project, including how the project contributes to energy efficiency or emissions improvements or reduction in life-cycle GHG emissions?	See Page 11
Support the FAA's preference to distribute grant dollars geographically?	OAK was NOT selected for any grants in the FY22 AIP Supplemental Discretionary awards.
Take advantage of the flexibility of eligibility in the Appropriations Act that is not available under other FAA grant programs, such as projects in the Airfield Operational Resiliency, Sustainable Aviation Fuel, or Emissions and Energy Priority Project Categories?	While Energy Supply, Redundancy and Microgrids are eligible AIP expenses outside of this NOFO, the AIP project prioritization process has made it challenging for OAK to secure related funding in the presence of critical airfield safety improvements. Therefore, this supplemental NOFO provides a unique opportunity for the Airport to also fund its energy resilience priorities.
Advance to grant very quickly or have a particular demand for funding in FY 2024?	See pages 19-20

Project Narrative

Background Information

Oakland, California is one of the largest cities in the San Francisco Bay Area (Bay Area) and the Alameda County seat. The Port of Oakland (Port), a Department of the City of Oakland, is a critical gateway connecting Northern California to the global market. The Port owns and operates Oakland International Airport (OAK) a public-use, primary commercial service, medium hub airport, which is the primary airport for the greater East Bay, the most populated area in the metropolitan San Francisco Bay Area. OAK served more than 11 million passengers in 2023. The Port also owns and operates the 9th largest seaport in the United States and much of the land along Oakland's waterfront.

OAK supports more than 30,000 jobs in the region with more than $1.6 billion in annual economic impact. OAK facilities are located on approximately 2,600 acres of land and include terminals, airfields, a rental car center, parking, air cargo, corporate and general aviation, a municipal golf course, and maintenance facilities. OAK's commercial passenger terminals (Terminals 1 and 2) have a total of 29 gates and include the International Arrivals Building. The main commercial runway, Runway 12/30, primarily serves commercial air carrier operations and corporate jet departures, with additional runways serving other corporate and general aviation purposes.

The Port is a sustainability leader in the transportation and goods movement sector, partnering with regulatory agencies, neighboring cities, tenants, and private sector partners to improve the environment, social responsibility, and the economy. As a major economic engine for the Bay Area, modernization and continuous improvement at the Port plays a defining role in the socioeconomic and environmental quality of the region. The Port is constantly searching for ways to upgrade and improve the resilience of its infrastructure and operations and be a good neighbor to the surrounding communities. In furtherance of this goal, since 2022, OAK has maintained its annual certification in the Airport Carbon Accreditation program, an aggressive carbon emissions reduction program that includes a greenhouse gas inventory and voluntary reduction activities. OAK has established a nonbinding target to reduce Scope 1 and Scope 2 greenhouse gas emissions 50 percent by 2030 and 100 percent by 2040.

airport carbon accredited
REDUCTION

OAK's commitment to sustainability and resilience drives this Project to go beyond the status quo utility upgrade and chart a new course for the Airport to reduce carbon emissions, strengthen the Airport against disruptions, and use energy more efficiently. But there are complex challenges in managing energy that need careful attention. These challenges include:

Aging Infrastructure: The condition of electrical infrastructure at OAK has become a serious impediment to the Port's objectives. One of two primary substations (SS-1) that bring power onto Airport property from the Pacific Gas & Electric's (PG&E) grid is at the end of its useful life, with an outdated 5 kV feed. The electrical distribution system and backup generators serving the airport campus are outdated in some areas and in need of upgrades and replacement.

Electrical capacity constraints: As the load-serving entity that provides electricity to the Airport and its tenants, the Port is responsible for the electrical distribution network downstream of its two main points of connection with PG&E at SS-1 and SS-1a. OAK is situated in a constrained load pocket and must carefully manage the projected growth in its electrical demand to remain under the current 8.3 MW cap established by PG&E. This limit requires a sophisticated strategy for how OAK manages existing loads, future loads, on-site generation, and energy storage, if OAK is to electrify and continue to grow and reduce GHGs.

Natural and human-made disasters: OAK is located in an area susceptible to earthquakes and natural disasters related to climate change (sea level rise, wildfires). A significant earthquake or other disaster could severely disrupt the Port, hindering its ability to continue regular airport operations, but also its ability to participate in and support local and regional response and recovery. The Airport's 2022 Airport Emergency Plan is based on the assumption that energy will be available. Continued access to electrical power, and directing that power to critical loads such as airfield lighting, is central to OAK's ability to continue operations through such an emergency. Additionally, the Airport is a hub of critical infrastructure, playing a crucial role for the community and for the region during emergency situations. The resiliency this Project provides will benefit the community and region as it will ensure greater operational uptime when it is needed most.

Air Quality: OAK is striving to mitigate the emission of criteria pollutants from its mobile and stationary assets. OAK's mission to reduce GHG emissions will also further the reduction of criteria pollutant emissions. This entails the electrification of vehicles, and replacement of diesel-burning vehicles and equipment that are needed for critical operations.

Microgrid

The next step in OAK's transformative journey towards sustainability and resilience is the replacement of Port-owned substation SS-1, currently at the 60% design stage. This crucial upgrade is essential to overcome the challenges posed by aging infrastructure and ensure the Airport's ability to accommodate expected growth. However, the cornerstone of OAK's strategic vision lies in the construction of a brand-new 12kV distribution substation: SS-EV1. SS-EV1 represents a significant milestone in OAK's GHG

reduction plans and is central to the Airport's electrification and resilience efforts. This substation will be directly connected to both SS-1 and SS-1a, serving as the nerve center for supplying existing EVs, including airport shuttle buses, airport fleet vehicles and equipment, and future EV charging loads, such as those at the rental car facility and heavy-duty trucks.

The new SS-EV1 substation and Shuttle Bus Charging Depot are critical to putting OAK on the path to zero emissions and will ensure that the growing electrical demand from EVs is connected to new equipment at a central location. Because of the long lead-times for substation components, OAK has already initiated its procurement of the new SS-EV1 substation and secondary substations' switch gear and transformers for the bus chargers, with an expected delivery date in late 2027 for installation and commissioning, and activation in 2028. The locations of the substations are illustrated in Figure 1.

OAK is also planning for the acquisition of a new low-emission flexible fuel cell to replace the existing 350 kW diesel generator, as the main power source (with electricity as the backup) for OAK's main runway lighting vault, which supports the primary runway and taxiway lights. Excess power generated by the fuel cell that is not used for the airfield lighting system will be redirected and used as base load power in other systems at the Airport. This Project will increase the resilience of these critical facilities, reduce GHG and criteria pollutant emissions, and bring the Airport's emergency backup power system for airfield lighting up to current FAA codes and regulations.

These and other projects will contribute to OAK's resilience, climate, and social responsibility objectives. However, the system as it currently stands will have no "smarts": no controls or logic to take full advantage of the potential in the various components such as power sharing, peak shaving/load shedding, or the alignment of solar and battery resources with critical loads. These projects are potential elements of a system, and an unmissable opportunity to advance OAK's broader objective to achieve resilience and airfield protection through the establishment of an Airport-owned and -operated microgrid. With appropriate enhancements contemplated in this proposal, the SS-1 and SS-EV1 substation projects could become a hub for a system to monitor and manage the multiple elements of a microgrid including solar power, BESS, vehicle-to-grid (V2G), fuel cells, and back-up power for critical loads.

By interconnecting electrical infrastructure with zero-emissions electrification loads, the Airport Resiliency through Microgrid Implementation Project (refered to as the Microgrid Project or simply microgrid) aims to achieve several strategic objectives:

- Decarbonization and Resilience: By integrating renewable energy sources and proactively managing diverse electrical loads, the microgrid will reduce GHG emissions and enhance the Airport's resilience to natural disasters and disruptions.
- Capacity Expansion: With the growing demand for electrical power, particularly for vehicle charging and facilities, the microgrid will create additional capacity "behind-the-meter" to accommodate growth while adhering to constraints set by PG&E.

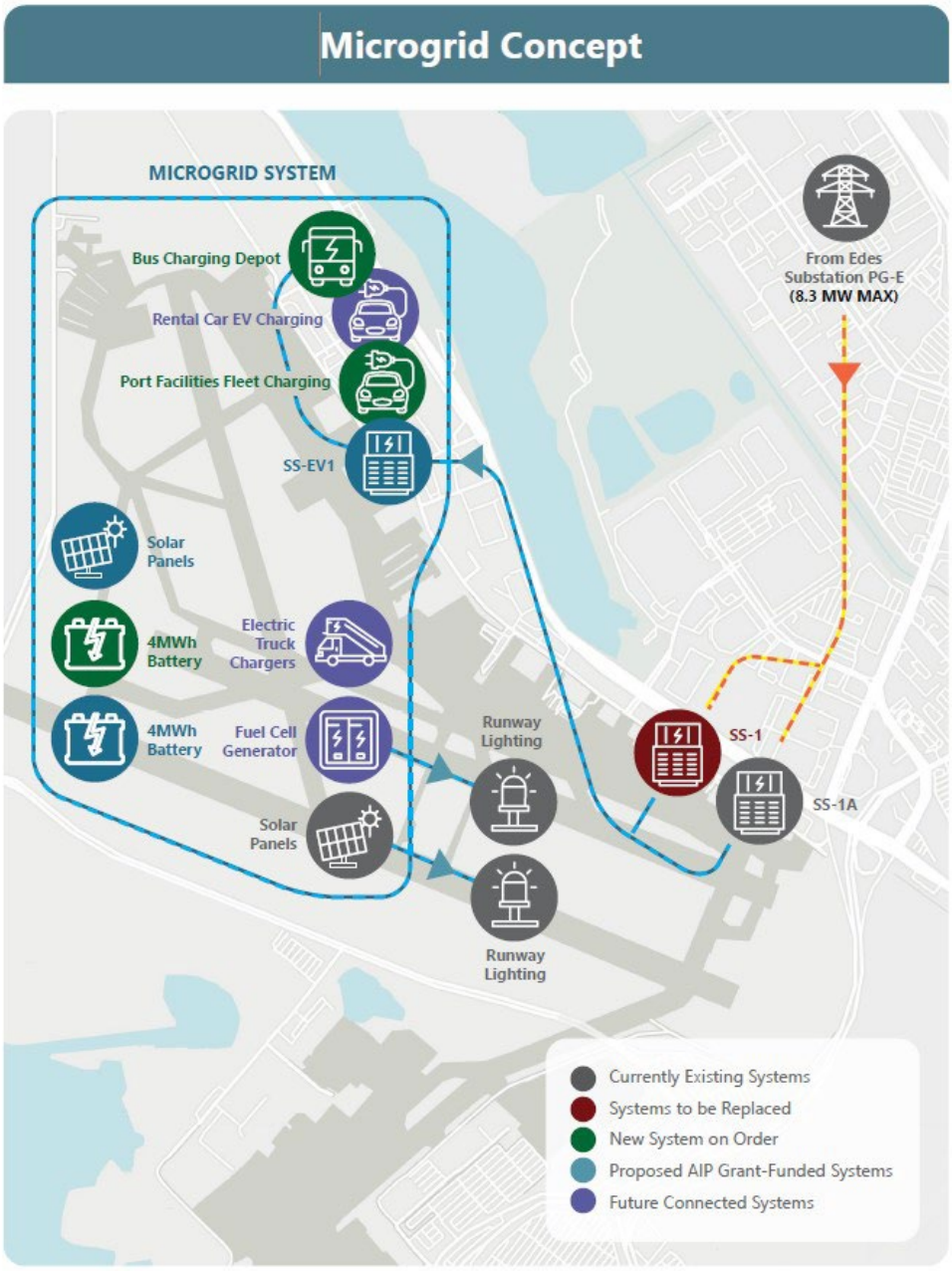

Figure 1 - Conceptual Layout of the Microgrid System

- Peak Shaving and Grid Independence: Through the integration of renewable energy and storage, the microgrid will enable peak shaving, reducing the Airport's dependence on the PG&E grid and mitigating demand peaks.
- Air Quality Improvement: Full vehicle electrification and cleaner fuel technologies, such as fuel cells for backup power, will contribute to improved air quality, benefiting surrounding communities' health and welfare.

- Critical Infrastructure Support: Ensuring the uninterrupted supply of power to critical loads, such as airfield lighting, during emergencies aligns with OAK's regional responsibilities to maintain essential infrastructure while enhancing air quality.
- Operational Uptime Enhancement: By increasing resilience and reducing downtime, the microgrid will enhance operational uptime, ensuring continued airport operations even in emergencies.
- Energy Efficiency and Optimization: The microgrid supervisory control and data acquisition system will provide an invaluable stream of data which will allow the OAK to track and audit the energy performance of its electrical systems and equipment, and better understand how energy is generated and used throughout the Airport. This will support better maintenance and management of energy resources and further GHG reductions.

Scope of Work

This Project will construct and connect the new SS-EV1 substation to OAK's distribution grid, the Shuttle Bus Charging Depot, solar photovoltaics array (PV), and BESS, to provide capacity for existing and future zero emissions electrification loads. Specifically, this Project will procure, install, and construct the cabling, and associated equipment for SS-EV1 and the Shuttle Bus Charging Depot, the construction of the microgrid system, the installation and configuration of the microgrid SCADA system, as well as the procurement and installation of a 1 MW/4 MWh BESS and a 780 kW PV array.

The additional distribution and switching equipment at the SS-1 location will serve as a backbone for the microgrid and the interconnection of the SS-1EV substation with all these sources and loads. The overarching microgrid control system will achieve full control and integration (i.e., the "brain" of the microgrid). Such a system would achieve several goals which for years have been among OAK's key priorities for energy resilience, emissions reduction, and facilities excellence:

- Interconnect a discrete set of power sources and loads into a small-scale microgrid which could be subsequently expanded and enhanced as resources become available.
- Create electrical capacity to accommodate ever-increasing demand for electrical power for vehicle charging and building electrification.
- Proactively manage the anticipated diverse loads to reduce demand peaks.
- Integrate more behind-the-meter renewable energy and storage to enable peak shaving and thereby mitigate the Airport's growing demand on the PG&E grid.
- Improve local and regional air quality through the support of full vehicle electrification.
- Provide power to critical loads with cleaner fuel, increased resiliency, and greater operational uptime and thereby support OAK's regional responsibilities to maintain its critical infrastructure during emergencies while improving air quality.

The actual microgrid control systems will be co-located with the new SS-EV1 substation and will manage the collective electrification loads on the eight breakers on SS-EV1 (at least four of which will be dedicated to EV charging) as well as critical loads such as airfield lighting. The BESS would also be located at the SS-EV1 site, in close proximity to the Shuttle Bus Charging Depot, the Rental Car Center,

Airport Facilities Shops and Headquarters, and the anticipated locations of future loads associated with electric ground support equipment (eGSE) and other heavy equipment such as electric trucks.

Project Benefits

The microgrid project will enable OAK to overcome challenging electrical capacity constraints, withstand natural and man-made disasters, improve air quality, and aging infrastructure while meeting its obligations to surrounding communities, electrifying its fleet and operations, reducing GHG emissions, and accommodating future growth. Specifically, OAK intends to include the following capabilities as it designs and builds out this Project:

Sustainability and Resilience. The Project represents a pivotal step towards addressing multifaceted challenges while embracing sustainability and resilience principles. By harnessing innovative solutions, OAK aims to transcend barriers posed by electrical constraints, natural calamities, air quality concerns, and aging infrastructure. This initiative not only fulfills OAK's commitment to surrounding communities but also facilitates the electrification of its fleet and operations, reduces GHG emissions, and accommodates future growth. Within the framework of sustainability and resilience, the Project offers a spectrum of benefits that fortify OAK's position as a forward-thinking and environmentally responsible entity:

The 780 kW of solar proposed in this project would reduce OAK's GHG emissions by 388 $MTCO_2e$ annually, or approx. 9,700.08 $MTCO_2e$ over the system's 25-year useful life. Dividing this total into the cost of the solar component of the project ($2.4m) yields a cost effectiveness of $247/MTCO2e.

Source: Solar Output – PVWatts; Grid Emissions Factor - eGRID

- **Centralized Grid Management**: Establishing OAK as a centralized hub for intelligent grid management optimizing electrical system operation.
- **Integrated Energy Balance**: Monitoring and balancing electrical loads, renewable energy, and storage components create a harmonized energy ecosystem, ensuring optimal utilization of resources and maximizing sustainability and efficiency.
- **Reliable Emergency Power:** Ensuring the delivery of electrical power to critical systems during outages guarantees uninterrupted operations, enhancing the Airport's resilience against unforeseen disruptions and emergencies, including increasingly frequent climate change-related wildfires.
- **Emissions Reduction**: Implementing measures to significantly reduce GHG emissions and promote electrification supports environmental sustainability goals, mitigating the Airport's carbon footprint and contributing to climate change mitigation.
- **Clean Fleet Support:** Supporting the elimination of emissions from vehicle fleets through full electrification and ample charging infrastructure accelerates the transition to cleaner transportation modes, reducing air pollution and promoting public health.

- **Renewable Backup Power:** Supporting the transition to 100% renewable backup power reduces dependence on fossil fuels, enhancing energy resilience and aligning with long-term sustainability objectives.

Efficiency and Optimization. Amidst a landscape of challenges, the microgrid project OAK stands as a beacon of efficiency and optimization. By surmounting hurdles posed by electrical constraints, natural calamities, air quality issues, and aging infrastructure, OAK is poised to fulfill its commitments to neighboring communities while advancing fleet electrification, reducing GHG emissions, and accommodating future growth. Specific benefits include:

- **Efficient EV Charging:** Enabling effective monitoring and management of electric vehicle charging across the Airport facilitates the rapid transition to electric fleets, optimizing charging schedules and minimizing energy waste and cost.
- **Scalable Integration:** Facilitating seamless integration of additional renewable energy sources and storage technologies ensures scalability and adaptability to future energy needs, maximizing efficiency and optimizing resource utilization.
- **Demand Management:** Effectively managing future electrical demand to remain within capacity limits ensures stable and sustainable energy consumption, preventing overloading of electrical infrastructure and minimizing the risk of disruptions.

Safety and Compliance. Safety and compliance are paramount considerations that emphasize operational integrity and public trust. The proposed microgrid project stands as a testament to the Airport's unwavering commitment to safety, security, and regulatory adherence. By addressing a myriad of challenges ranging from electrical constraints to natural disasters, OAK is not only fortifying its infrastructure but also ensuring compliance with industry standards and regulations. This section details into how the microgrid project enhances safety measures and ensures regulatory compliance, bolstering the Airport's resilience and reliability in the face of adversity.

- **Enhanced Safety:** Providing upgraded, modernized, and resilient backup power for airfield lighting and EV charging enhances operational safety and security, ensuring uninterrupted operations and compliance with safety regulations.
- **Regulatory Compliance:** Meeting FAA standards for emergency backup equipment ensures operational safety and regulatory compliance, safeguarding Airport operations and maintaining industry standards.
- **Reliable Emergency Power:** Delivering electrical power to critical systems during outages ensures uninterrupted operations, enhanced safety and compliance with regulations.

Equity. The microgrid project at OAK not only advances sustainability and operational efficiency but also fosters equity and community empowerment. By prioritizing equity considerations throughout its design and implementation, the Project will address historical disparities and promote social justice within the Airport community and neighboring areas. Key equity activities include:

- Community Engagement and Representation: The Port has a strong history of effectively engaging with community stakeholders while managing complex and sensitive projects bridging both residents and industry interests. The Port has conducted extensive public engagement to incorporate neighboring community needs into their projects and continues to work with residents, businesses, and a multitude of stakeholders via public information meetings, consultations, social media outreach, and other forms of stakeholder engagement.
- Environmental Collaboration and Community Engagement: The Port has been working together with the Bay Area Air Quality Management District (BAAQMD), 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 (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. In the period between December 2023 and March 2024 alone, the Port participated in 13 community meetings with community-based organizations on "Our Road to Zero Emissions." The Port continues the partnership with its participation in the BAAQMD AB 617 East Oakland Steering Committee which focuses on community-based emissions reductions in neighborhoods most disproportionately impacted by air pollution through the development of an East Oakland Community Emissions Reduction Plan (CERP).
- Equitable Engagement Practices and Compliance. In addition to its direct engagement with stakeholders in the community, the Port implements best practices to ensure its activities are fully compliant with the Title VI of the Civil Rights Act of 1964 and other equal access laws. The Port'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 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 accessible accommodations.

Job Creation and Economic Opportunities. The Port has been at the forefront in pioneering job creation and access to well-paying jobs with an intentional focus on removing barriers towards employment since 2000, when the Port adopted the region's first Maritime and Aviation Project Labor Agreement

(MAPLA) with the Building and Construction Trades in Alameda County ("BTC"). It was designed to ensure project labor stability, the employment of Port Local Impact Area (LIA) (Oakland, Emeryville, San Leandro, and Alameda) residents, and the utilization of Port recognized small businesses.

MAPLA established local hiring goals for disadvantaged workers, new hire apprentices, and a commitment from the construction building trades to induct 25 new Local Impact Area (LIA) apprentices each year into the "List Trades" (at least 10 into MAPLA List Trades) which are defined as highly skilled trades such as Electricians, Sheet Metal Workers, Plumbers, Sprinkler Fitters, Elevator Constructors, and Glaziers. 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).

OAK's Social Justice Committee meets monthly to monitor contractor local hire performance and provide recommendations to assist contractors with achieving their MAPLA requirements. MAPLA also established a Social Justice Trust Fund (SJTF) where contractors are obligated to make hourly contributions to the fund, enabling training for low-income residents in the Port's LIA. SJTF funds granted in 2020-2023 totaled $249,000 and supported local pre-apprenticeship training programs.

Table 1 - MAPLA Outcomes 2020 - 2023

	Goal	Actual
LIA Residents	50%	28.93%
LIA/LBA Residents	50%	59.16%
LIA Apprentices	50%	53.98%
Disadvantaged Workers	25%	44.83%
New Hire Apprentices	10	11

The Port has adopted an Operations Jobs Policy (Jobs Policy) that includes a Cooperation Agreement focused on equity, access, and well-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, and the creation of the Jobs and Stakeholder Working Group (SWG) to support implementation of the agreement.

The Port employs a Workforce Development Manager dedicated to supporting policies and initiatives aimed at expanding economic opportunities for LIA residents. This manager oversees the Port's relationships with local community-based organizations, organized labor partners, and job providers and seekers. Moreover, the manager coordinates several workforce initiatives, including a collaborative research project called "Improving Effectiveness of Project Labor Agreements (PLAs)" in partnership with the San Francisco Foundation. This Project aims to diversify the construction workforce through PLAs, with Phase I focusing on conducting a comprehensive analysis and generating actionable findings.

The Port's broader labor goals include identifying and developing workforce development strategies to serve as a regional intermediary linking new and incumbent workers to career pathways in aviation, maritime, transportation, distribution, and logistics. The proposed initiative, Port Passages, leverages the collective expertise and resources of various stakeholders to address the workforce needs of Port industry employers and labor with both new and incumbent workers. Furthermore, the Port is committed to ensuring wage compliance with the Living Wage and Prevailing Wage Ordinance across all its projects. As part of this commitment, the Port has historically served as a trainer for other local public agencies and contractors on these policies.

Environmental Justice and Health Equity. Many of the tracts in the East Oakland community close to the Project have been identified as disadvantaged based on projected traffic proximity, lead paint, risk management plan (RMP) facility proximity, hazardous waste proximity, underground storage tank proximity, demographic index, less than high school education, and people of color. OAK is in a federally designated Historically Disadvantaged Community (Census Tract 4090) and Opportunity Zone (06001409000), as shown in Figure 2, which also includes metrics from the City of Oakland's Equity Map showing designated Priority Neighborhoods. The Priority Neighborhoods are identified by the City of Oakland using census data to identify the census tracts where the population is most adversely affected by racial and socioeconomic inequity.

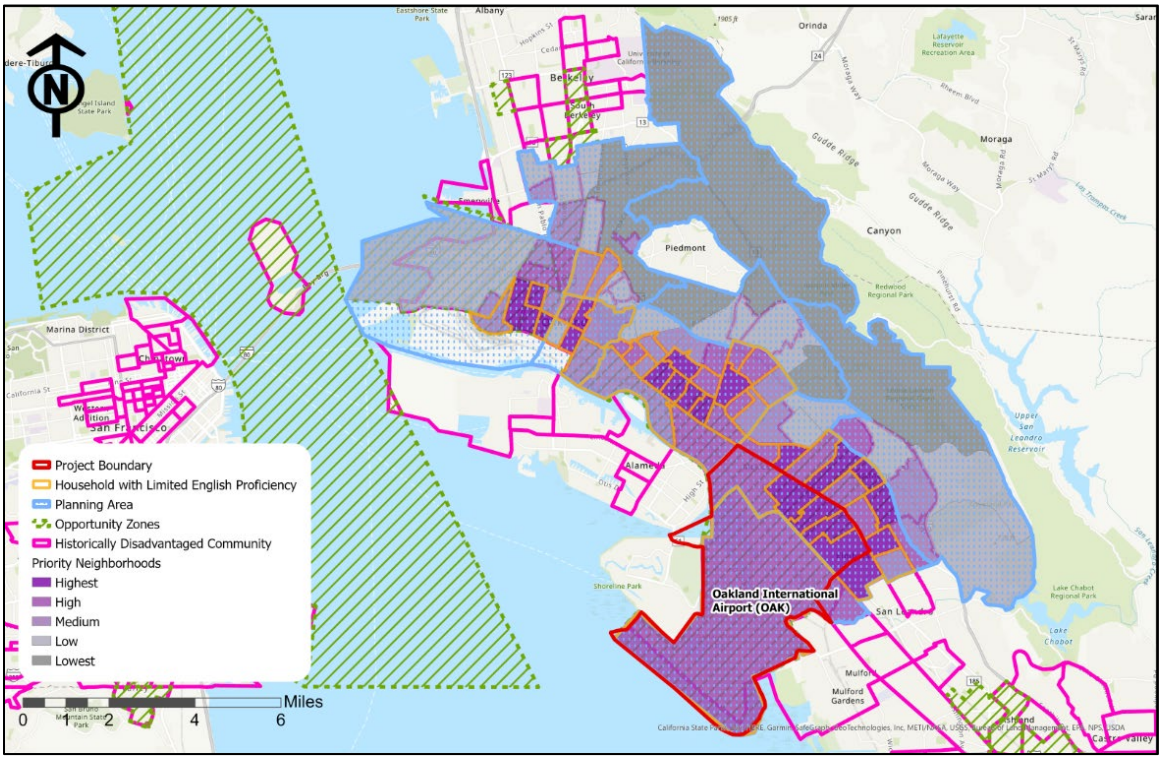

Figure 2 - Project Area Location Within Historically Disadvantaged Community, Opportunity Zone, and Equity Metrics
Source: USDOT's Climate and Economic Justice Screening Disadvantaged Census Tracts tool, HUD Opportunity Zones, OakDOT Geographic Equity Toolbox, City of Oakland.

CalEnviroScreen 4.0/California Climate Investments designated this project's census tract as both a disadvantaged community and priority population. **The Project area ranks in the 92nd percentile for Pollution Burden, 94th percentile for Population Characteristics, and 97th percentile for CalEnviroScreen 4.0.** The tract ranks within the 70th – 81st percentiles for socioeconomic factors, most notably 18.3 percent of the census tract population is comprised of Children (Age 10 or less) and 8.7 percent Elderly (Age 65 of Greater). **The population within the census tract has a percentile score of 100 for Asthma and 98 for Low Birth Weight.**

Figure 3 - Airport Area Disproportionately Burdened by Multiple Sources of Pollution
Source: California Communities Environmental Health Screening Tool CalEnviroScreen 4.0, https://experience.arcgis.com/experience/11d2f52282a54ceebcac7428e6184203/page/CalEnviroScreen-4_0/

OAK and the neighboring communities in East Oakland face significant challenges with air quality, ranking among the highest in pollution levels in the Bay Area. This issue has led to their identification as a priority area under Assembly Bill (AB) 617 Community Health Protection Program, highlighting the urgent need for action. Much of the pollution stems from sources associated with major goods movement and transportation corridors, contributing to higher rates of asthma emergency room visits and cardiovascular disease in the East Oakland community compared to other areas in California. The region also grapples other public health and socioeconomic problems. These communities are part of the Metropolitan Transportation Commission's (MTC) Equity Priority Communities effort, representing census tracts with a significant concentration of underserved populations, including low-income households and people of color.

The detrimental effects of poor air quality extend beyond just heart and lung health, with recent studies indicating negative impacts on academic performance among students. Once implemented, this Project will play a pivotal role in addressing these pressing environmental health concerns and improving air quality in communities disproportionately affected by airport operations.

By facilitating the transition to electrification of vehicles and replacing diesel-burning equipment like back-up generators, the Project aims to significantly reduce emissions, rectify historical disparities, and prevent future inequities.

The Project's benefits extend directly to disadvantaged environmental-justice communities adjacent to the Airport, fostering a healthier environment and supporting adoption of cleaner energy sources.

Project Alignment with DOT Strategic Framework

The Project closely aligns with the Department of Transportation's (DOT) strategic framework, of safety, economic prosperity, equity, climate action, and transformation.

- Safety Objectives: By ensuring the provision of reliable backup power for critical systems like airfield lighting, the microgrid enhances operational safety, aligning with the DOT's goal of making transportation safer for all individuals.
- Economic Objectives: The Project contributes to job creation and fiscal health by supporting American workers and businesses through the development of sustainable regional economies. Additionally, by modernizing core assets and enhancing resiliency, the microgrid project fosters economic competitiveness and strengthens the local economy.
- Equity Objectives: Through community engagement efforts and the integration of equity considerations into project planning and implementation, the microgrid project expands access to transportation, jobs, and business opportunities, particularly for underserved communities. By empowering communities and ensuring equity in transportation investments, the Project embodies the DOT's commitment to fostering exchange and ownership among diverse stakeholders.
- Climate Objectives: The microgrid project plays a pivotal role in advancing climate action by reducing air pollution and GHG emissions from transportation. By improving infrastructure resilience and institutionalizing climate-informed decision-making, the Project contributes to the transition towards a sustainable transportation system, aligning with the DOT's goals of achieving net-zero emissions by 2050 and addressing climate justice concerns.
- Transformation Objectives: Through purpose-driven research, innovation, and collaboration with diverse stakeholders, the microgrid project embodies the DOT's vision of designing for the future. By fostering discoveries, experimentation, and flexibility in transportation investments, the Project paves the way for a modernized transportation system that serves the present and future.

The microgrid project at OAK exemplifies a comprehensive approach to transportation infrastructure development, closely aligned with the DOT's strategic framework and executive orders. By addressing critical challenges, promoting economic prosperity, fostering equity and community empowerment, advancing climate action, and driving transformational change, the Project sets a precedent for sustainable and resilient transportation initiatives nationwide and can be a model for other airports.

Schedule & Financial Plan

The Project's schedule and cost estimate, broken out by funding source, are presented in the table below.

Table 2. Project Schedule & Financial Plan

Task or Project Phase	Start Date (MM/YYYY)	End Date (MM/YYYY)	Cost Estimate	AIP Share (80.59%)	Other Federal Share	Port Share
Construct SS-EV1 substation and connect to SS-1 and SS-1A	09/2027	04/2028	$15.0 M	$12.1 M	-	$2.9 M
Construct bus charging station load center and connect to SS-EV1	06/2027	04/2028	$7.0 M	$5.6 M	-	$1.4 M
Port Engineering Labor	Ongoing	Ongoing	$1.5 M	$1.2 M	-	$0.3 M
Procure and connect microgrid infrastructure	09/2025	03/2028	$2.1 M	$1.7 M	-	$0.4 M
Procure and connect Microgrid SCADA/controls	09/2027	03/2028	$0.5 M	$0.4 M	-	$0.1
Procure and connect BESS	04/2027	06/2027	$1.9 M	$1.5 M	-	$0.4
Procure and connect PV	04/2027	10/2027	$2.4 M	$1.9 M	-	$0.5
Test and commission system	09/2027	4/2028	$0 (included in construction and SCADA)	-	-	
Total Costs			$30,830,000	20,000,000*	-	$10,830,000*

** The costs displayed are based on engineer's cost estimates for construction of the project. The AIP share requested for this grant will be limited to $20 million per the Notice of Funding Opportunity (NOFO).*

Project Costs

Project components are as follows:

- Construction: This includes select procurement of substation materials and equipment, any demolition and site preparation associated with SS-EV1 and the microgrid control station, trenching and installation of electrical infrastructure and communications equipment, site preparation and installation of any PV and BESS.
- Equipment: This includes electrical cabling and communication infrastructure to connect the SS-EV1 substation to OAK's electrical distribution system, the microgrid control system hardware and housing, a 1 MW/4 MWh BESS, and a PV array.
- Port Engineering Labor: This comprises Port engineering staff time spent managing projects; supervising contractors; reviewing and approving civil, structural, electrical, and mechanical designs and construction documents; and inspecting and accepting interim and final construction and equipment installation.

- **Consulting:** Professional services for this Project will include microgrid configuration, programming, commissioning; environmental coordination and permitting, and construction administration/management.

Funding Sources

The Port requests $20 million in AIP funding and intends to provide the remaining $10,830,000 from OAK's Aviation Capital Improvement Plan (CIP) budget. Although OAK's typical AIP share of 80.59% yields a federal share of $24,845,897, the amount requested through AIP has been capped at $20 million per the NOFO.

Any remaining costs after federal contributions will be funded by the Port.

Project Readiness

The design for the replacement SS-1 is at 60%, and $10 million of the equipment for SS-EV1 is in procurement and likely to be ordered within the next month. The secondary substation for the Shuttle Bus Charging Depot is also in the procurement phase. The stage is therefore set for the substation projects that would serve as the foundation for the microgrid. OAK's microgrid consultant has evaluated how such a system would be configured and provided a cost estimate for the microgrid control system, BESS and PV. The project managers for the proposed fuel cell have been participants in the microgrid discussion and are on board to ensure that this element is integrated with the system.

Technological Maturity: OAK has been considering a microgrid project for several years as a means to efficiently address multiple energy, climate, and resilience challenges. Microgrid technology is sufficiently mature for this Project to be relatively low-risk.

Timing: The replacement of SS-1 and construction of the new substation SS-EV1 have further crystallized the Airport's commitment to meeting the above challenges through a microgrid. It is most practical and efficient to implement a microgrid while the new substations are being designed and installed, rather than waiting and adding the capability after the fact. OAK in fact applied for an AIP grant in 2023 to fund a BESS/PV system as part of this vision. Although the grant was not awarded, the Airport has moved forward and budgeted this Project for FY 2025, with a request for proposals currently outstanding with an anticipated award date of this month.

The Airport has partnered with neighboring City of San Leandro on a U.S. Environmental Protection Agency Climate Pollution Reduction Grant to develop a local source of renewable natural gas (RNG) to eliminate emissions from the use of fossil natural gas at the Airport. If awarded, the first phase of the RNG project, which would support the delivery of RNG by truck, would be completed in January of

2025. This fuel would be the initial energy source for the planned fuel cell and would further OAK's efforts to reduce diesel emissions.

Commitment: OAK has already invested significant resources in pushing this Project forward by contracting for the design phase and preparing $10 million in early procurement for the substation equipment. The Airport is already consulting with microgrid providers who have evaluated the Airport's current conditions, electrical infrastructure needs, and desired functionality of a microgrid. They have recommended that the microgrid be combined with the substation project and provided cost estimates for the microgrid control system, BESS, and PV systems identified as part of this Project. Additionally, although the Port is its own electrical utility, it maintains regular contact with PG&E on strategies to meet future demands.

Momentum: The design phase of the SS-1 and SS-EV1 substations is underway. Knowing market demand for substation equipment such as transformers and switchgear are at an all-time high, OAK is initiating early procurement of long-lead items so as to expedite the construction phase. Transformers and switchgear comprising SS-EV1 is expected to be delivered and constructed in 2027, with commissioning in 2028. The microgrid project will be executed around the construction of SS-EV1 to be ready for operational testing at the time SS-EV1 is energized. The Airport is continuously engaging with PG&E on this and a range of other projects.

The Project schedule is organized around the following key milestones:

- Design for SS-1 is at the 60% stage.
- Design for SS-EV1 is in progress and will conclude 11/2024.
- Construction bids for SS-EV1 will be received by 1/2025.
- NEPA review will be complete by 5/2025.
- SS-EV1 will be installed and commissioned in late 2027/early 2028.
- Microgrid design and construction will occur approximately 9/2025 – 9/2027.
- Microgrid control systems initial installation and programming will occur mid-2027.
- System integration, testing, and validation (PV, BESS, EV charging) will occur late 2028.
- Project will be substantially complete and operational by April 2028.

Usable Unit of Work & Severability

The microgrid project consists of multiple units of work and can be funded in phases. OAK has prioritized the useful units of work as follows:

1) Sub-station construction and interconnection with the Shuttle Bus Charging Depot
2) Smart electrical distribution infrastructure with a microgrid control system
3) Connected 780 kW solar array, each with associated and construction and consulting costs
4) Connected 1 MW/4 MWh of battery energy storage system (BESS)