







**Table 2: Near-Term Action Plan (Years 2019-2023)**  
(Revised Pursuant to Board Resolution No. 20-59, July 23, 2020)

#	Specific Implementing Action	Appendix C Implementing Action Number and Name	Category	Lead	Classification	Summary of Implementing Action	2019	2020	2021	2022	2023	
1	13 Hybrid Rubber-Tired Gantry (RTG) Cranes at SSAT	E-CHE-3. Expand Use of Hybrid Cargo-Handling Equipment Where Zero-Emissions Equipment is Not Commercially Available or Affordable		T	P	The Bay Area Air Quality Management District (BAAQMD) awarded a Carl Moyer grant to Stevedoring Services of America Terminals (SSAT), the terminal operator at the Oakland International Container Terminal (OICT), for the purchase of 13 hybrid RTG cranes. SSAT is using this grant to replace the diesel engines in its entire fleet of RTG cranes at OICT. Phase-in is expected to require approximately 2 years. The first RTG crane was repowered in February 2019, and subsequent repowers are expected to occur approximately every 2 months. Overall criteria air pollutant emissions from the hybrid RTG cranes are reduced 99.5% compared to the existing diesel units.	Implementation / Construction	Implementation / Construction	Operation	Operation	Operation	
2	90% Shore Power Use	E-OGV-1. Shore Power Improvements - Achieve 90% Shore Power Use	 	PO	P	As part of its grant requirements, the Port will continue to work with ocean carriers and tenants to improve plug-in rates to achieve an overall 90% plug-in rate in 2020.	Impl./Constr.	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	
<b>Zero- and Near-Zero-Emissions Freight Facilities (ZANZEFF) Project Components</b>												
3	10 Electric Class 8 Trucks plus Charging Infrastructure at Shippers Transport Express (STE)	E-T-4. Short-Haul Drayage Truck Demonstration Testing		PO	T	P	The Port of Long Beach, in collaboration with the ports of Oakland and Stockton, was recently successful in obtaining a ZANZEFF grant from the California Air Resources Board (CARB). The Oakland component of the grant includes deploying 10 electric drayage trucks at Port tenant Shippers Transport Express (STE), and five electric yard tractors and one battery-electric top-pick at the Matson Terminal (Berths 60-63). Testing will assess the performance of the various types of equipment, including operating time between charges, time required to recharge the vehicles, performance under load, maintenance requirements, and more. Pursuant to the Memorandum of Understanding between the Port of Oakland and the Port of Long Beach dated February 7, 2019, the Port committed to construct the necessary charging infrastructure for the drayage trucks to be deployed at STE.	Impl./Constr.	Impl./Constr.	Operation	Operation	Operation
4	1 Battery-Electric Top-Pick Plus Charging Infrastructure at Matson Terminal (SSA)	E-CHE-5. Demonstration Testing of Electrically-Powered Cargo Handling Equipment		T	P		Impl./Constr.	Impl./Constr.	Operation	Operation	Operation	
5	5 Electric Yard Tractors plus Charging Infrastructure at Matson Terminal (SSA)	E-CHE-5. Demonstration Testing of Electrically-Powered Cargo Handling Equipment		T	P		Impl./Constr.	Impl./Constr.	Operation	Operation	Operation	








 Equipment     Infrastructure     Operations

 Tenant     Port of Oakland     Programmed<sup>1</sup>

Impl./Constr. = Implementation / Construction

<sup>1</sup> Programmed Actions are those that have passed the feasibility evaluation and for which funding has been approved. See Step 5 of Screening and Evaluation of Implementing Actions for a description of Programmed and Suggested Actions. Suggested Actions are actions that have not been screened or evaluated.

**Table 2: Near-Term Action Plan (Years 2019-2023) (cont.)**

#	Specific Implementing Action	Appendix C Implementing Action Number and Name	Category	Lead	Classification	Summary of Implementing Action	2019	2020	2021	2022	2023
<b>Port Fleet Electrification</b>											
6	10-passenger Electric Van	E-M-1. Port Fleet Conversion and Charging Infrastructure		PO	P	In June 2018, the Port purchased a 10-passenger electric van for use at the Seaport.	Operation	Operation	Operation	Operation	Operation
7	Large Capacity Forklifts (1)	E-M-1. Port Fleet Conversion and Charging Infrastructure		PO	P	The Port used the screening and evaluation process for Implementing Actions to assess the viability of purchasing battery-electric vehicles and equipment for its fleet. Although the electric equipment is considerably more costly, the Port decided to purchase six electric vehicles and equipment as a pilot test in Fiscal Year 2019 (Board Resolution 18-117). Three of the battery-electric vehicles will be assigned to the Seaport Area; the specifications for these vehicles are expected to go to bid in Spring 2019.	Impl./Constr.	Operation	Operation	Operation	Operation
8	Work Trucks (2)	E-M-1. Port Fleet Conversion and Charging Infrastructure		PO	P		Impl./Constr.	Operation	Operation	Operation	Operation
<b>Infrastructure</b>											
9	Replace Electrical Infrastructure That is Beyond its Serviceable Life	I-9. Future Infrastructure Modifications.		PO	S	Certain components of the Seaport electrical grid are nearing the end of their serviceable life and need to be replaced and potentially upgraded. The Port will identify high-priority components and integrate the replacement of these components into its budget planning cycle.			Impl./Constr.	Impl./Constr.	Operation
10	Port Electrical Grid Reliability and Capacity Upgrades	I-9. Future Infrastructure Modifications.		PO	S	In addition to replacing electrical grid components that have reached the end of their serviceable life, the Port will also undertake specific actions to increase the resilience and capacity of the Seaport's electrical grid.			Impl./Constr.	Impl./Constr.	Operation
11	Charging Infrastructure - Harbor Facilities	E-M-1. Port Fleet Conversion and Charging Infrastructure		PO	P	In June 2018, the Port installed charging infrastructure at its Harbor Facilities building to charge fleet and personal vehicles. Additional charging infrastructure may be installed to accommodate the battery-electric equipment described in Items 6, 7, and 8 above.	Impl./Constr.	Operation	Operation	Operation	Operation
12	Charging Infrastructure - Impact Transportation	I-9. Future Infrastructure Modifications		T	P	Impact Transportation has installed charging equipment and placed an order for an electric yard tractor.	Impl./Constr.	Operation	Operation	Operation	Operation

 Equipment     Infrastructure

**T** Tenant    **PO** Port of Oakland    **P** Programmed    **S** Suggested

Impl./Constr. = Implementation / Construction

**Table 2: Near-Term Action Plan (Years 2019-2023) (cont.)**







#	Specific Implementing Action	Appendix C Implementing Action Number and Name	Category	Lead	Classification	Summary of Implementing Action	2019	2020	2021	2022	2023
<b>Other Demonstration Projects</b>											
13	BYD <sup>2</sup> Phase I: Electric Drayage Truck at GSC Logistics	E-T-4. Short-Haul Drayage Truck Demonstration Testing		T	P	Since February 2018, GSC Logistics has been operating a first-generation electric short-haul drayage truck.	Operation	Operation	Operation	Operation	Operation
14	BYD Phase II: Electric Drayage Trucks (up to 10 trucks total)	E-T-4. Short-Haul Drayage Truck Demonstration Testing		T	S	Deploy up to 10 BYD electric short-haul drayage trucks at Port tenant locations. The testing will assess the performance of the trucks, including operating time between charges, time required to recharge the vehicles, performance under load, maintenance requirements, and more. Phase II provides improved technology compared to Phase I.	Impl./Constr.	Operation	Operation	Operation	Operation
<b>Studies and Plans</b>											
15	Maritime Power Capacity Study for Terminal Electrification	I-3. Maritime Power Capacity Study for Terminal Electrification		PO	P	The scope of the study includes: <ul style="list-style-type: none"> <li>Existing system loads; existing distribution system model; and future system needs</li> <li>Terminal cargo handling equipment electrification needs</li> <li>Distribution system capacity and upgrade requirements</li> <li>Transmission system capacity and upgrade requirements</li> <li>Pacific Gas and Electric Company (PG&amp;E) transmission system capacity</li> </ul>	Impl./Constr.				
16	Future Infrastructure to Support Zero-Emissions Port Fleet	E-M-1. Port Fleet Conversion and Charging Infrastructure		PO	S	The Port will continue to assess its infrastructure needs as it continues to convert its fleet to zero-emissions equipment over time.			Pot. Impl./Constr.	Pot. Impl./Constr.	Pot. Impl./Constr.
17	Track Tenant Equipment Purchases and Respond to Tenant Needs for New Infrastructure	Technology Tracking and Performance Monitoring	 	PO	S	Monitor equipment used by tenants and encourage the purchase of cleanest technologies. As tenants decide to purchase zero-emissions equipment, the Port will work with the tenants to determine the need for any new supporting infrastructure. Tenants will need to work with PG&E at locations served by PG&E.	Pot. Impl./Constr.	Pot. Impl./Constr.	Pot. Impl./Constr.	Pot. Impl./Constr.	Pot. Impl./Constr.
18	Electric Vehicle Infrastructure Guide for Port Tenants	I-5. Electric Vehicle Infrastructure Guide for Port Tenants		PO	P	To facilitate Port tenants' ability to install electrical charging infrastructure, Port staff are preparing a guide that includes relevant information regarding permit and other requirements, and that provides the necessary forms for permit applications.	Impl./Constr.				

Equipment   
 Infrastructure   
 Tenant   
 Port of Oakland   
 Programmed   
 Suggested

Impl./Constr. = Implementation / Construction  
 Pot. Impl./Constr. = Potential Implementation / Construction






<sup>2</sup> BYD is an original equipment manufacturer of, among other products, battery-electric drayage trucks.

**Table 2: Near-Term Action Plan (Years 2019-2023) (cont.)**

#	Specific Implementing Action	Appendix C Implementing Action Number and Name	Category	Lead	Classification	Summary of Implementing Action	2019	2020	2021	2022	2023
19	Investigate Use of Renewable Diesel for Land-Based and Marine Equipment	F-4. Renewable Diesel Fuel		PO	S	The Port is continuing to coordinate with CARB, fuel producers, and fuel users to assess the benefits of implementing renewable diesel for Port tenants and partners. Depending on the outcome of this assessment, the Port will work to educate appropriate users about the benefits of using renewable diesel.	Pot. Impl./Const.	Pot. Impl./Const.			
20	Investigate Use of Renewable Diesel in Port-Owned Diesel-Powered Vehicles	F-4. Renewable Diesel Fuel		PO	P	The Port's fleet manager is evaluating the switching from petroleum diesel to renewable diesel for the Port's fleet. A new contract would have to be put in place to purchase renewable diesel.	Impl./Const.	Impl./Const.			
21	Evaluate Vessel Speed Reduction (VSR) Program	O-4. Evaluate Vessel Speed Reduction Program		PO	S	In consultation with the San Francisco Bar Pilots and other partners, the Port will evaluate the potential for a voluntary and an incentivized VSR program after the results of the BAAQMD pilot study are available. An incentivized VSR program could be included as part of an overall environmental incentive program. VSR in the outer Precautionary Zone would reduce Seaport-related diesel particulate matter (DPM) emissions by about 2 tons per year and greenhouse gases (GHGs) by approximately 4,200 to 4,500 metric tons of carbon dioxide equivalents (CO2e) per year in 2020 (Starcrest 2018).	Potential Implementation / Construction	Potential Implementation / Construction			
<b>Monitoring and Tracking</b>											
22	Track Hybrid RTG Crane Installation at OICT	Technology Tracking and Performance Monitoring		PO	P	The Port will coordinate with SSAT to track the performance of the hybrid RTG cranes as they are implemented at the OICT. Tracking will assess items such as fuel consumption, operability, and manufacturer performance.	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity
23	Track Development of Uniform Charging Standards for Electrically-Powered CHE at San Pedro Bay Ports (SPBP), and Advocate for Specific Port Needs as Applicable	I-7. Uniform Charging Standards for Electrically-Powered Terminal Equipment and Drayage Trucks	 	PO	P	Manufacturers of electric terminal equipment are using different methods and equipment design specifications for equipment charging, resulting in different infrastructure requirements depending on the equipment and specific manufacturer selected. As more terminal equipment is transitioned to electric power, these different equipment charging approaches may lead to significant challenges. The SPBP have been working with regulatory agencies, technology developers and equipment operators to establish uniform charging standards for yard tractors and other CHE. The Port will continue to track the development of the uniform charging standards, and assist with the review of the standards.	Potential Implementation / Construction	Potential Implementation / Construction	Potential Implementation / Construction		

 Fuels
  Operations
  Equipment
  Infrastructure
 
 Port of Oakland
  Programmed
  Suggested

**Table 2: Near-Term Action Plan (Years 2019-2023) (cont.)**

#	Specific Implementing Action	Appendix C Implementing Action Number and Name	Category	Lead	Classification	Summary of Implementing Action	2019	2020	2021	2022	2023
24	Monitor Shore Power Use	O-5. Monitor Shore Power Use		PO	P	The Port tracks shore power usage on a monthly basis to identify problems and opportunities for increasing shore power use.	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity
25	Track Port Tenant Incentive-Funded Zero-Emissions Equipment and Associated Infrastructure (e.g., Prop 1b and Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project [HVIP] Funding)	Technology Tracking and Performance Monitoring		PO	P	The Port will continue to track the progress of tenant deployment of zero-emissions and other alternatively fueled equipment and vehicles, and tenants' success with obtaining grant and incentive funding for their equipment and charger purchases.	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity
26	Conduct Emission Inventories	Monitoring and Reporting		PO	S	The Port prepared Seaport Emission Inventories (EIs) for the years 2005, 2012, 2015, and 2017. The Port will continue to prepare EIs to evaluate the progress of emissions reductions efforts. The next EI is intended to be completed for the Year 2020.		Impl./Constr.			Impl./Constr.
27	Continue to Coordinate with Port Efficiency Task Force (PETF) (or future equivalent) and Others to Identify and Implement Efficiency Measures	P-6. Participate in Industry Stakeholders Groups		PO	P	The Port will continue to coordinate with the PETF and others to identify new potential efficiency measures to reduce the overall emissions per ton of cargo over time.	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity
28	Track Clean Air Action Plan (CAAP) Technology Advancement Program Results	P-1. Track San Pedro Bay Ports' CAAP Progress and Technology Advancement Program		PO	P	The Port will continue to proactively reach out to SPBP to stay informed regarding various initiatives under the CAAP, including incentive programs and technology demonstrations.	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity



Operations



Partnerships



Port of Oakland









Programmed



Suggested

Impl./Constr. = Implementation / Construction

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29	Track SPBP Zero/Near-Zero Emissions Feasibility Studies	P-1. Track San Pedro Bay Ports' CAAP Progress and Technology Advancement Program		PO	P	The Port will track the CAAP feasibility studies.	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity
30	Track SPBP Truck Rate Study	FG-4. Track SPBP Truck Rate Study		PO	P	The SPBP have started a study of the potential implementing considerations, including costs, and implications, such as effects on independent owner-operator truckers, of a truck rate. The Port will track the outcome of this study to determine whether a similar study at the Port of Oakland is appropriate.	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity
31	Meet with Port Tenants Annually to Discuss Current Air Quality Measures and Room for Improvement	P-5. Meet with Port Tenants		PO	P	On an annual basis, the Port will meet with selected tenants (marine terminal operators, rail yard operators, and tenants with more than 100,000 square feet of building space) to receive an update on the tenant's efforts to reduce air emissions associated with its operations and to provide an update to the tenant on recent technological improvements. The annual update will include an inventory update of all CHE from all tenants with more than 100,000 square feet.	Implementation / Construction	Implementation / Construction	Implementation / Construction	Implementation / Construction	Implementation / Construction
<b>Other Actions</b>											
32	Encourage Railroads to Use Cleanest Possible Equipment in Oakland	E-L-5. Encourage Railroads to Use Cleanest Engines in Oakland		PO	P	The Port will send a letter to railroads operating in the Seaport Area and encourage their use of the cleanest equipment at their local rail yards and use of their cleanest engines to haul trains that pass through their local rail yards.	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity
33	Actively participate in Trucker Work Group, Harbor Trucking Association (HTA), and Western States Trucking Association (WSTA)	P-6. Participate in Industry Stakeholders Groups		PO	P	The Port will continue to actively participate in trucker associations to share information on recent technological improvements and available grant and incentive programs, and to receive feedback on equipment cost and performance.	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity
34	Port Environmental Office Hours for Trucking Companies and Truckers	P-3. Port Environmental Office Hours for Trucking Companies and Truckers		PO	P	The Port has established weekly office hours to provide truckers with information pertaining to servicing modern trucks and grant and incentive programs for zero-emissions vehicles.	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity



Partnerships


















Funding and Grants

 Programmed

 Port of Oakland

**Table 2: Near-Term Action Plan (Years 2019-2023)** (cont.)

#	Specific Implementing Action	Appendix C Implementing Action Number and Name	Category	Lead	Classification	Summary of Implementing Action	2019	2020	2021	2022	2023
35	Participate with PETF, Pacific Merchant Shipping Association, and Other Industry Stakeholders to Keep Informed and Provide Updates on Zero-Emissions Technologies	P-6. Participate in Industry Stakeholders Groups		PO	P	The Port will continue to coordinate with industry stakeholders to receive and share updates on new technologies, equipment performance and operability experience, and costs.	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity
36	Implement Workforce Development Plan	P-12. Workforce Development Plan		PO	S	The Port will implement the Workforce Development Plan in <a href="#">Appendix E</a> .	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity
37	Pursue Low Carbon Fuel Standard Credits	FG-2. Financing Mechanisms and Sources		PO	S	The Low Carbon Fuel Standard (LCFS) was amended in January 2019 to allow for credits from fuel use by heavy-duty mobile equipment. The Port will pursue credits for the electrical power it supplies to support this equipment. The Port has registered its shore power substations as sources eligible for LCFS credits.	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity
<b>New Actions Pursuant to Board Resolution No. 20-59, July 23, 2020</b>											
38	Upgrade Tug Engines	Suggested Action #198. (WOCAP #50)	  	AD	P	Use BAAQMD (Air District) financial incentives to upgrade tugs operating at the Port.		On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity
39	Establish Dedicated Truck Parking	Suggested Action #188. (WOCAP #26)		PO	P	Establish 15 acres of dedicated truck parking and container staging area at Seaport.		On-Going Activity	On-Going Activity	On-Going Activity	On-Going Activity

 Partnerships  
  Funding and Grants  
  Operations  
  Equipment  
  Bay Area Air Quality Management District  
  Port of Oakland  
  Programmed  
  Suggested

Source: Port of Oakland 2019

WOCAP = West Oakland Community Action Plan