

GOLDMAN SCHOOL OF PUBLIC POLICY

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Center for Environmental Public Policy

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Comments on
*Draft Seaport Air Quality
2020 & Beyond Plan*

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Introduction and Summary

The Center for Environmental Public Policy thanks the Port of Oakland Board and Staff for the opportunity to comment on the draft *Seaport Air Quality Plan* (June 29, 2018). Port staff and leadership deserve recognition for their work on this draft plan. We especially thank the Port Staff for being available to discuss and answer questions about the Plan and for their comments on our recent report on state funding for truck electrification.¹

We support and applaud the proposal to transition Seaport operations to zero emissions. This would be a ground-breaking commitment that will establish the Port of Oakland as a leader in air quality improvement, in environmental justice and in climate sustainability. In these comments we recommend that the final plan provide additional detail on the scope of the commitment. In particular, we believe that as an indirect source of air pollution, Port operations are associated with emissions from trucking that brings freight to and from the Port. While the Port does not own and control most trucking operations associated with the Port, it can and should create conditions under which trucking can gradually evolve toward zero emissions. This could include efforts by the Port to facilitate power-supply and vehicle charging infrastructure and to consider entry fees that create financial incentives for transition to zero emission transport.

¹ [Financing Low- and Zero- Emission Freight Transportation Technologies in California, https://gspp.berkeley.edu/assets/uploads/page/Press_Release_8-29-18.pdf;](https://gspp.berkeley.edu/assets/uploads/page/Press_Release_8-29-18.pdf)
[https://gspp.berkeley.edu/assets/uploads/page/Funding_Programs_Summary_final_August_29.pdf.](https://gspp.berkeley.edu/assets/uploads/page/Funding_Programs_Summary_final_August_29.pdf)

We also urge the Port to modify its air pollution and greenhouse gas inventory to account for emissions from trucking associated with port operations, including emissions that occur outside the Port boundaries on trips involving freight transport to and from the Port. Emissions associated with truck trips from the vehicles' home base and to the initial destination of the freight (e.g. warehousing or logistics sites) should be accounted for in the inventory.

We support the Draft Plan's emphasis on electrification as a prime emission reduction strategy. We also urge caution and suggest limitations on any reliance on natural gas and Renewable Diesel.

These comments recommend an expansion of the measures to be implemented in the near-term and that the Port should be prepared to support some near-term measures with its own capital resources.

We recommend that the Port commission a study that provides a detailed inventory of diesel equipment operating at or delivering/receiving containers at the Port. This data base will be valuable to target state financial incentives, and Port planning needed to optimize the transition to electric drive technology for heavy duty freight operations.

We recommend that the Port lead a work group to plan for installation and maintenance of a system to identify trucks entering the port with high diesel emissions and a mechanism to notify the truck owners of the need for repair as a condition of continued Port access. The Port should complement these efforts with emission system repair services at a location on the Port property or a near-by, non-residential, locations (perhaps in association with the 15-acre truck parking area at the former OAB). This will produce near term health benefits, that can balance the longer-term health benefits of evolving freight operations to zero emission technology.

The Port should set up a team or teams to maximize receipt of state funding for charging infrastructure and zero emission equipment, both for its own operations, but also those of terminal operators and trucking fleet owners. Without such a coordinated effort we fear that funding will flow to other parts of the state, and Oakland could miss opportunities for progress on air quality improvement. This team could also be charged to assess the impact of electric rate demand-charges on electrification of transport and recommend changes as needed to eliminate a potential barrier to investment in electric drive equipment.

The following discussion provides additional detail on these recommendations.

Zero Emission Goal

We support the following goal as expressed in the Draft plan.

“The vision of the 2020 and Beyond Plan is the transition of Seaport operations to zero-emissions operations through changes in equipment, operations, fuels, and infrastructure.”

The importance and credibility of the Port's zero-emission vision, however, would be enhanced by adding detail regarding the scope of the commitment. One could read the goal as only applying to equipment that operates exclusively within the Port. This would be a limited goal that would not establish the Port as a leader in this area. While transitioning cranes, ship berthing and cargo handling equipment to zero emission is an appropriate near-term goal, the Port should clarify that its commitment is to also achieve, over time, zero emissions from the trucking that moves freight to-and-from the Port.

We recommend the final plan clarify that the scope extends to trucks serving the Port, not just equipment owned by the Port and the terminal operators. One can't have a "zero-emissions Seaport" without addressing emissions from trucks entering and leaving the Port.

We recognize that the Port does not have control over all of this equipment and can't mandate trucking to become zero emission. It can, however, both facilitate and create economic incentives for truck owners to transition gradually to electric drive technology.

Actions the Port could take in this regard include the following near-term actions:

- Support the development of electric supply infrastructure sufficient to meet growing electric power demand from heavy duty vehicle charging, and catenary systems. Examples include the following:
 - Technical studies of electric distribution system capacity. We understand that the Port has budgeted for a study of Port electric supply infrastructure in 2019. It will be important that the scope of this study include scenarios for gradual expansion of electric vehicle charging infrastructure.
 - Coordinate planning on electric supply with similar efforts by PG&E, in regard to those portions of the Port that are served by PG&E. This work is essential to maximize the amount of funding available for electrification from the funds authorized for heavy-duty truck charging by the California Public Utility Commission. The risk here is that PG&E may move forward with projects not associated with the Port, which would retard efforts to move the Port as a whole to zero emission freight operations.
 - Integrate the electric power supply work with projects to add renewable generation at the Port and near-by former Army Base. We understand there are plans to add solar power generation on rooftops at the former Army base. We expect there are similar opportunities with-in the jurisdiction of the Port. On site electric power supply from renewables could help optimize supply options and charging infrastructure.
- Electric Vehicle charging: The Port should begin to actively plan for locations and power supply to support a gradual increase capacity for heavy duty vehicle charging. For example, electric drive technology is available to power virtually the entire yard hostler fleet at the Port. As the existing equipment gradually ages toward retirement, the charging systems should keep pace to ensure that eventually the entire fleet is

electrified. Similarly, it should be possible to forecast how drayage trucking that brings containers to and from the Port will transition to electric drives and to assess how much Port-based charging services will be needed to accommodate that shift. Some drayage trucking will undoubtedly depend on off-port charging infrastructure, but having the option to charge at the port will be important for some trucking duty-cycles.

- **Economic Incentives:** The Port should consider whether to establish entry fees for trucks, with reduced or no fees for zero emission trucks. This should be set to occur several years in the future, so that trucking operators can take the fee into account as they replace aging equipment and as availability of electric drives increases in the market. Our understanding is that the Los Angeles Ports are planning to implement a fee system and if so their planning might provide guidance to implement such a system in Oakland. Revenues from entry fees could be used to offset costs of electric supply and vehicle charging systems at the Port.

Port Emission Inventory

Our understanding is that the current inventory of Port emissions is limited to emissions that occur from equipment operations within the physical boundary of the Port. This presents an inaccurate picture of the impact of the Port on regional and local air quality. It also tends to over-emphasize the relative importance of different equipment types. For example, the following statement, is probably inaccurate if the inventory included emissions of trucks as they bring containers to and from the Port:

“As discussed in more detail in Appendix B (see Emissions Estimates in Appendix B), 82% of the remaining Seaport-related DPM emissions are associated with ocean-going vessels (OGV), primarily OGV in transit.”

Page 10 of Draft.²

We recommend that inventory be revised to include emissions from trucks entering and serving the Port, including emissions from trips to the initial destination of freight being picked up from the Port, the last point of origin for containers being brought to the Port, and the return trips to the vehicles' primary base. A high degree of certainty in these numbers is not necessary. Estimates can be made from available public information and surveys. The purpose is to get a rough idea of the magnitude of these emissions as they affect local and region air quality and contributions to global climate pollution.

We believe this can be done without disrupting the existing inventory methodology. The Port can add a component to the inventory methodology, in a way that preserves an apples-to-

² This is not to suggest that vessel emissions are unimportant. We recognize that the Port has made important progress in reducing emission from vessels and urge that it continue that progress.

apples comparison between past and future inventories, while also adding this new set of information. Other ports have adopted this approach:

With annual CO₂ emissions of well over 30 million tonnes in the port area emitted by the industrial cluster and around 24.8 million tonnes emitted by transportation to and from Rotterdam, the port is one of the major European GHG emissions hotspots.

Wuppertal Institute, Synthesis Report, April 2018 *Deep Decarbonization Pathways for Transport and Logistics Related to the Port of Rotterdam*, PoR Transport.³

Emission Goals

We strongly support the following goal from the Draft Plan

Goal #2: Minimize emissions of criteria air pollutants and toxic air contaminant (TACs)—with a focus on reducing DPM emissions—and local community exposure.

It is important to have a goal that is specific to DPM emissions, and to minimize all criteria air pollutants and their precursors. It is widely recognized that the federal NAAQS for particulate matter and ozone are not fully protective of health and do not specifically address exposure to DPM. Hence the Port is correct in establishing a goal that minimizes DPM emissions and ozone precursors, even if that means achieving air quality better than federal and state ambient air quality standards.

At page 9 we recommend that the statement, “contribute to attainment of federal and State ambient air quality standards,” be modified to state “attainment and maintenance of federal and state ambient air quality standards and to prevent significant deterioration of air quality.”

We also request that the Port establish specific emission reduction goals, expressed as actual emission reductions from specific measures for these pollutants.

Diesel Fuel Alternatives

We support that statement at pages 4 and 11 of the draft Plan:

“Strategy #3 focuses on the transition to zero-emissions operations, with the presumption that the predominant source of power will be electricity.”

Electric drives are likely to be the most cost-effective and quickest way to transition freight and trucking to zero emission technologies.

³https://www.portofrotterdam.com/sites/default/files/wuppertal_institut_2018_decarbonization_of_transport_and_logistics_synthesis_report.pdf

We are aware of proposals to reduce diesel emissions through use of Compressed Natural Gas (CNG) systems. We believe it would be a mistake to support CNG vehicle use, or supporting infrastructure at the Port of Oakland, unless strictly limited to renewable gas supplies (e.g. biomethane from EBMUD). Fossil gas from interstate and intrastate pipelines is associated with large emissions of methane and air toxics from gas production, storage, processing and transport sites. CNG fueling infrastructure is likely to be more expensive and dangerous relative to electric power charging. In addition, we recommend caution in regard to renewable gas use. Attention is needed to avoid encouraging investment in infrastructure or vehicle types that would inadvertently create demand for or channel for greater use of fossil/pipeline gas. Therefore at several places in the draft we recommend the Port clarify that only renewable natural gas would be considered a viable strategy to reduce emissions. See Draft Plan at Table C-1, and pages B-10, C-8-9, C-14, C-21, C-30.

We also have concerns about references in the Draft Plan to Renewable Diesel (RD). See page C-1. It appears that most RD is produced from Palm Oil or Palm Oil byproducts. See, <https://www.gladstein.org/the-potential-and-challenges-of-renewable-diesel-fuel-for-heavy-duty-vehicles/>. Palm Oil production often is associated with rain forest destruction.

... the choice of feedstocks used to produce RD can have a significant impact on the carbon intensity and GHG emissions benefits of RD. Palm oil feedstocks are of particular concern, having been linked to significant land use impacts including deforestation to provide land to grow and farm the palm oil.

Id. Moreover, while we did not undertake a thorough research effort on the question, the literature appears to show mixed results on the question of whether RD has lower black carbon and diesel particulate emissions. Compare, *Lower NOx But Higher Particle and Black Carbon Emissions From Renewable Diesel Compared to Ultra-low Sulfur Diesel in At-sea Operations of a Research Vessel*,⁴ with statement in draft plan at C-1; and, *CARB, Staff Report, Multimedia Evaluation of Renewable Diesel*, November 2013;⁵ Moreover, use of RD does not eliminate DPM entirely, at best only reduces it. These factors suggest caution in regard to substantial use of RD for operations at the Port. One option would be to state a clear preference for RD whose feed stock is based on waste oils produced from agriculture and food industry, but not palm oil-based feed stocks; and, to periodically review testing data before making claims regarding reductions in diesel particulate matter and black carbon emissions. Overall, this suggests that electric drives should be the priority for the Port in regard to alternatives for diesel fuels and that large infrastructure commitments to RD may not be warranted for a fuel that may only serve as a temporary measure, on the way to zero emission technologies.

⁴ <https://www.tandfonline.com/doi/pdf/10.1080/02786826.2016.1238034>.

⁵ https://www.arb.ca.gov/fuels/multimedia/meetings/RenewableDieselStaffReport_Nov2013.pdf.

Near-Term Measures

In regard to near-term and intermediate term elements of the plan, at page 9 we recommend that the list of examples to be expanded to include:

- facilitate electric truck purchases and charging equipment by terminal operators, fleet owners and port service companies.

We suggest this since we believe the market availability of electric truck and charging equipment is evolving rapidly and that at least some truck electrification can occur near-term at the Port. We recall statements to this effect by the Port of Oakland Executive Director Chris Lytle at a recent MAQUIP public meeting in regard to yard hostler equipment. Moreover, our review of the literature suggests that dozens of manufacturers, including Toyota, Volvo, Siemens, Tesla, BYD, OrangeEV, Bosch, Cummins, and Proterra currently produce equipment that can carry heavy loads 100 miles between charges. Daimler and others will sell medium and heavy-duty electric trucks with 200-250 mile range by 2021. A vibrant new market for batteries, electric drive-trains, charging equipment and power infrastructure is emerging and the Port should be ready to take advantage of the new technologies.

While we recognize that the capital costs may currently be higher than conventional equipment, there is a substantial pool of state incentive funds that can be tapped to reduce up-front costs. A report issued on August 28th by the Goldman School of Public Policy provides a roadmap to California state programs designed to boost markets for electric trucks, freight equipment and supporting infrastructure.⁶ Approximately \$1.8 billion is available to buy-down the initial cost of a wide range of equipment to reduce emissions from heavy-duty diesel-powered vehicles and cargo handling equipment. Electric trucks tend to have lower fuel and maintenance costs compared with diesel equipment. The combination of state funding and lower operation costs should make electric drives economic for some Port operations in the near term.

The Port should also consider actions to collect data on truck movement and idling (turn-around times) to help identify new strategies to reduce emission from truck and equipment idling and congestion.

We also recommend that several actions listed in the Intermediate and longer-term categories (pages 19-20) be moved into the near term action list. These include:

- Upgrades and/or construction of Port-Owned and PG&E owned Substations
- Increased use of hybrid and zero emission vehicles.
- Continued use of grant and incentive funding to replace or convert exiting CHE and drayage trucks to zero emission or hybrid equipment.

⁶ https://gspp.berkeley.edu/assets/uploads/page/Funding_Programs_Summary_final_August_29.pdf.

Hydrogen

Some elements of the evolution of direct drives for freight are less clear. For example, it is not yet clear what role hydrogen fuel cell technology will play in trucking. The Port should monitor the evolution of this technology particularly in regard to long-haul trucking that operates in and out of the Port. In this regard we recommend that the draft language at page 4, and elsewhere contain references to hydrogen power equipment and fuel, with the caveat that hydrogen to power trucking and port equipment should be produced from renewable feedstocks and power derived mostly from renewable generation sources.

Diesel Emission Abatement Milestones

The proposed language at Page 9, is too narrow:

“the Port will prioritize those actions that can be implemented in the near-term, are operational in nature (not requiring large investments in infrastructure)”

This statement should not be limited to “operational” and or actions not requiring infrastructure investments. To achieve a gradual move to zero emissions, some infrastructure may be needed in the near term. This can in some cases be funded in part from state incentives for electrification of trucking. Matching Port expenditures are warranted, since electrification over the long term will tend to reduce fuel costs for freight operations and help make the Port more competitive in freight markets.

Port investment in zero emission infrastructure will also improve health for people working at the Port and living in nearby neighborhoods. Some of the infrastructure can be funded by terminal operators, PG&E, Port utility revenues or freight service companies. The Port needs to facilitate and, in some cases, financially support electric supply and charging infrastructure, in the near term. While it is appropriate to concentrate on projects funded from state and other outside sources, it is also appropriate for the board to use some Port financial resources to support implementation of the Seaport Air Quality Plan goals.

Furthermore, we recommend, that the final plan include additional milestones to guide near-term actions. The following are suggested near-term milestones:

- Establish a plan to gradually move yard hostler equipment from diesel to electric drive technology, with a goal to replace half of the yard hostler fleet with electric drives by 2025 and complete replacement by 2030.
- Modify port electric supply infrastructure to accommodate a complete yard hostler transition to electric drives by 2030, along with a gradual/sustained increase in power supply and charging equipment for drayage trucks that bring containers to and from the Port.
- Commission and complete a study that provides a detailed inventory of diesel equipment operating at or delivering/receiving containers at the Port, to include the following data:
 - Age of equipment

- Ownership
- Home base
- Parking locations at the Port
- Typical equipment duty cycles (e.g. hours or miles per day)

This kind of inventory can be compiled from the Port's truck registry system, combined with data available from Alameda County Transportation, GeoStamp, and from terminal and fleet owners. This data base will be valuable to assist Port planning and to target state financial incentives and manufacturer marketing needed to optimize the transition to electric drive technology for heavy duty freight operations.

Truck Emission Monitoring and Repair Facility

In recent years the Port has cooperated in research to test systems that can identify trucks with malfunctioning emission controls, as they enter the Port. That research, led by Robert Harley, Chelsea Preble and Tom Kirchstedder of UC Berkeley, showed that 6-10% of trucks operating at the Port have high emissions. That research involved temporary placement of emission monitoring equipment at Port entry points. See page 9 of Draft Plan.

Significant near-term emission reductions from the existing trucking fleet could be achieved by placement of a permanent system to monitor truck emissions, notify operators of high emitting trucks, and require repair as a condition of operating at the Port. We recommend that the Port lead a work group to plan for installation and maintenance of such a system and for the creation of emission system repair services at a location on the Port property or a near-by non-residential location (perhaps in association with the 15-acre truck parking area at the former OAB). This will produce near term health benefits, that can balance the longer-term benefits of evolving freight operations to zero emission technology. It will also assist truckers who may otherwise need to travel long distances to access repair facilities for diesel particle traps and other pollution control equipment.

Port Security Benefits

We recommend that the Port assess security benefits of reducing presence of diesel and gasoline fuel and fueling infrastructure. Electrification of trucking and freight handling equipment will reduce fire, accident and terrorist risk, by reducing the need for flammable fuel storage and fueling infrastructure.

Funding

While it is appropriate to concentrate on projects eligible for funding from state and other outside sources, it is also appropriate for the Port Board to use some Port financial resources to support implementation of Air Quality Goals. For example, we support the decision of the Board to fund an electrical engineering study regarding the feasibility of electric power infrastructure at Port to support heavy duty vehicle electrification. See page 13 of draft and strategy 6, and page 23-25.

Funding for air quality improvement investment could be supported by fees for truck entry to the Port, with fees waived for zero emission trucking. This would create a stable funding resource, and would create a market signal to encourage investment in electric drives for trucks.

The Port should set up a team or teams to maximize receipt of state funding for charging infrastructure and zero emission equipment, both for its own operations, but also those of terminal operators and trucking fleet owners. Without such an effort we fear that funding will flow to other parts of the state, and Oakland could miss opportunities to make progress on air quality improvement.

A potential funding strategy could involve green bonds to support charging and electric supply infrastructure. There is growing appetite among investors for green bonds. It is possible that if the Port were to issue a bond for electric truck charging infrastructure, that it could be secured at a lower interest rate than for ordinary bonding. The Port could consider assembling a work group to explore this option. The California Treasurer's office has issued two excellent papers on green bond that provide information and briefing materials on green bonds. Volume 1 (February 2018) is available at:

https://www.treasurer.ca.gov/greenbonds/publications/reports/green_bond_market_01.pdf

Volume 2, released in August 2018 is available at:

<http://www.milkeninstitute.org/publications/view/927>

Electric Rates (Demand Charges)

The Port of Oakland's electric utility rates include demand charges, that in some cases could create an economic barrier to electric vehicle charging for commercial customers. Today, those charges are likely not a barrier, since vehicle battery charging is not currently large enough to increase demand during peak power consumption times. However, as the number of electric trucks increase, and to the extent that charging needs to occur during daytime/business hours (e.g. trucks charged during lunch breaks), the demand charges could become an impediment to investment in electric vehicles and charging infrastructure. A key advantage of electric trucks is that power and maintenance costs are lower than diesel fuel and engine maintenance - but demand charges can erode that advantage.

We recommend that the Port plan to assess the impact of its current rate structure, to potentially eliminate demand charges for vehicle charging or restructure the rates for those customers who have or plan to have substantial vehicle charging demand. This review could occur in mid-2019, and involve focus groups of Port customers who are considering these investments. The Port should consider running a pilot program that tests different rate structures for the "early adopters" of electric vehicle technology at the Port. The Port's utility rates should not operate as a barrier to electric vehicle and charging investments. Innovation on this subject by the Port may position the Port utility favorably in relation to competing power suppliers, for those customers who have a choice between the two services (PG&E).

Monitoring and Reporting page 22-23

We support the proposal to regularly update the plan, but suggest some with some additions.

“the Port expects to update the Plan in five years, with a focus on the Near-Term Action Plan, so that implementation can reflect changing conditions and perspectives, especially technology, financial resources, emissions reductions and stakeholder input.”

To support the 5-year update, the Port should hold semi-annual meetings for stakeholders to provide input and receive updates on progress, annual emissions inventory updates, and health risk assessment updates. These meetings and outreach effort would support an **annual review and revision** of the plan so that additional actions can be added to the Near-Term plan as new technologies and funding become available.

Conclusion

Thank you for the opportunity to comment on the draft Plan. We look forward to continuing to work with the Port to ensure progress towards a zero-emission port that will deliver cleaner, healthier air to the community. Please feel free to contact David Wooley if you have any questions or would like to discuss any of the above recommendations.

Respectfully submitted,

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