

Emissions Impact of Freight Movement Increases and Congestion near Ports of Los Angeles and Long Beach: Jan. 2022

January 27, 2022 Update

- The San Pedro Bay Ports (SPBP), which include the Ports of Los Angeles and Long Beach, have been experiencing a substantial increase in cargo imports, resulting in significant congestion at terminals and in surrounding areas. This has led to emissions increases from freight-related sources. These increases are based on (1) a large number of vessels anchored near the coast, and (2) increases in activity of freight-related categories such as trucks, rail, and cargo handling equipment.
- **New:** A new queuing system¹ was implemented by Pacific Maritime Management Services (PacMMS) in mid-November, encouraging ships to wait outside of the "Safety and Air Quality Area" until they are within 72 hours of a berthing assignment. Overall, there has been a decrease in the number of anchored vessels following the mid-November peak of 86 containerships at anchor or loitering near the SPBP.

Table 1. Summary of Excess NOx Emissions (tpd) near San Pedro Bay Ports by Source Category

Month-Year	Port Trucks	Regional Rail	Cargo Handling Equipment	Containerships at Anchor
May 2021	3.2	5.2	1.1	5.1
June 2021	4.2	1.9	0.3	2.1
July 2021	1.3	2.7	0.3	4.3
August 2021	1.0	3.6	0.5	8.2
September 2021	2.0	2.4	0.3	17.5
October 2021	0.2	2.8	0.5	17.2
November 2021	tbd	1.5	0.5	24.4
December 2021²	tbd	tbd	tbd	6.4
6-Month Average	1.9	2.5	0.4	12.9

¹ <https://www.pacmms.org/one-page-express/stm/resources/>

² Data for TEU movement lags behind data on anchorage by approximately a month, therefore port truck, rail and cargo handling equipment emission estimates will lag anchorage emissions impacts by a month as well.

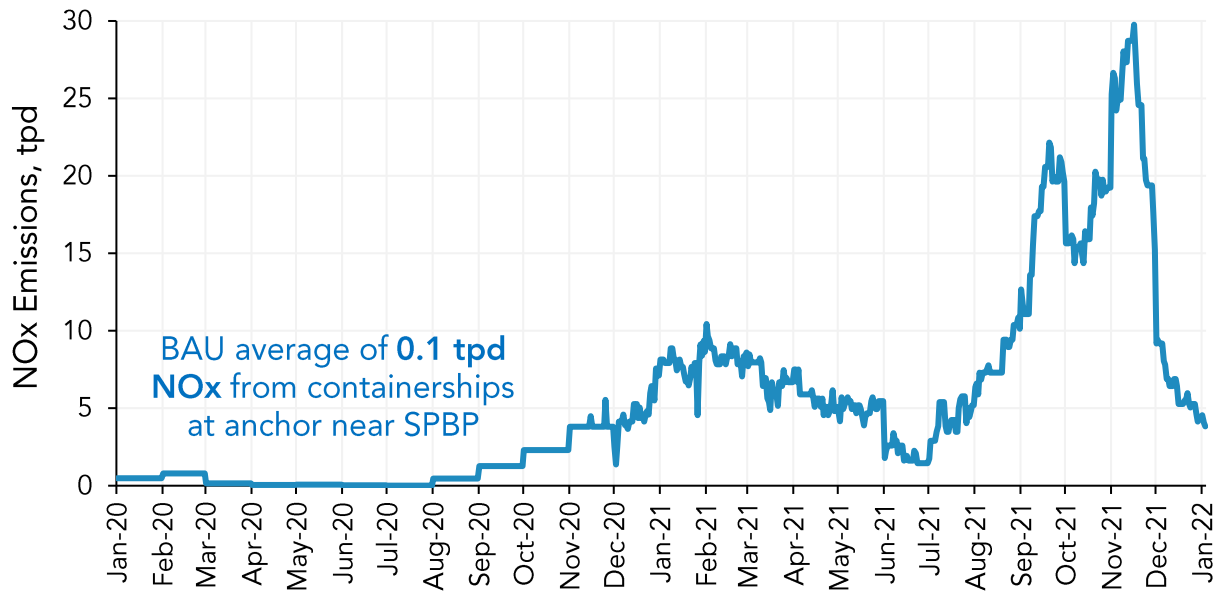
Table 2. Summary of Excess PM Emissions (tpd) near San Pedro Bay Ports by Source Category

Month-Year	Port Trucks	Regional Rail	Cargo Handling Equipment	Containerships at Anchor
May 2021	0.020	0.123	0.033	0.134
June 2021	0.027	0.045	0.010	0.064
July 2021	0.008	0.063	0.008	0.118
August 2021	0.006	0.085	0.014	0.225
September 2021	0.013	0.058	0.001	0.489
October 2021	0.001	0.068	0.014	0.461
November 2021	tbd	0.035	0.015	0.638
December 2021³	tbd	tbd	tbd	0.178
6-Month Average	0.013	0.0120	0.059	0.351

Containership Anchorage

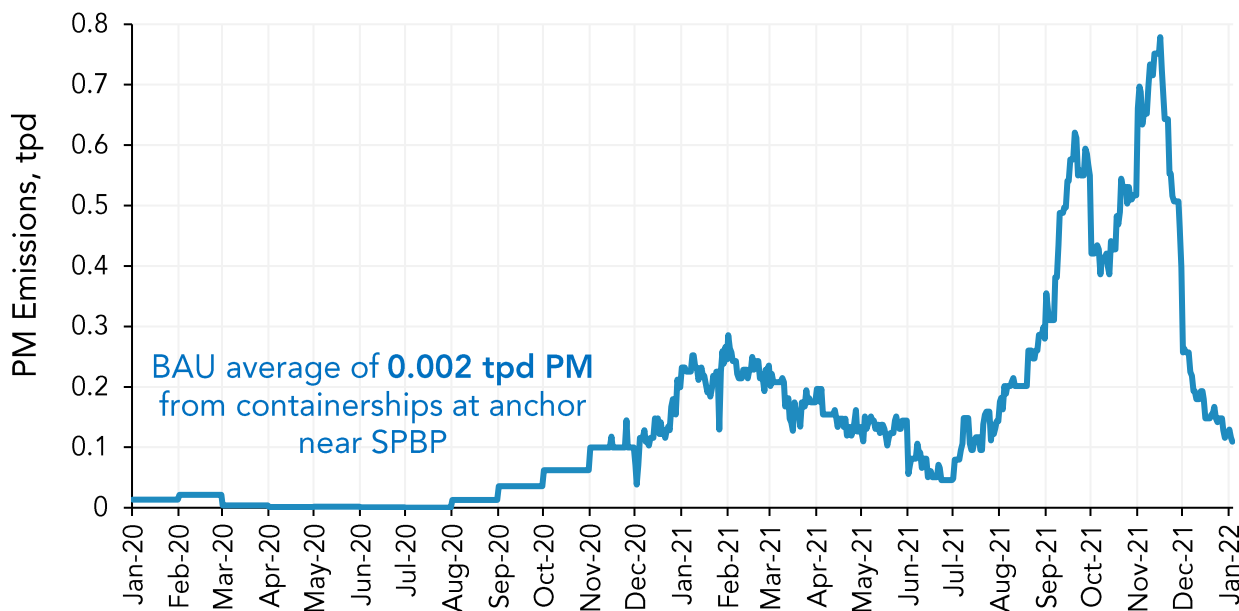
The following figures show increased emissions from auxiliary engines and boilers used by the record number of vessels at anchorage.

Figure 1. NOx Emissions from Anchored Containerships at the San Pedro Bay Ports



³ Data for TEU movement lags behind data on anchorage by approximately a month, therefore port truck, rail and cargo handling equipment emission estimates will lag anchorage emissions impacts by a month as well.

Figure 2. PM Emissions from Anchored Containerships at the San Pedro Bay Ports



Increased Freight Movement

The number of containers, or twenty foot-equivalent unit (TEUs), being moved through SPBP is at an all-time high⁴. This increase in freight movement requires additional activity by port trucks and/or rail in the region, as well as cargo handling equipment used at the port. Using reported port truck trips, and modeling that rail and cargo handling equipment activity increased in proportion to the additional TEUs moved through the port, the following surplus emissions would be seen in South Coast Air Basin due to increased freight movement.

⁴ Port TEU data is available here <https://www.portoflosangeles.org/business/statistics/container-statistics> and here <https://polb.com/business/port-statistics/#latest-statistics>

Figure 3. NOx Emissions from Freight Movement by Trucks, Rail, and Cargo Handling Equipment near the San Pedro Bay Ports

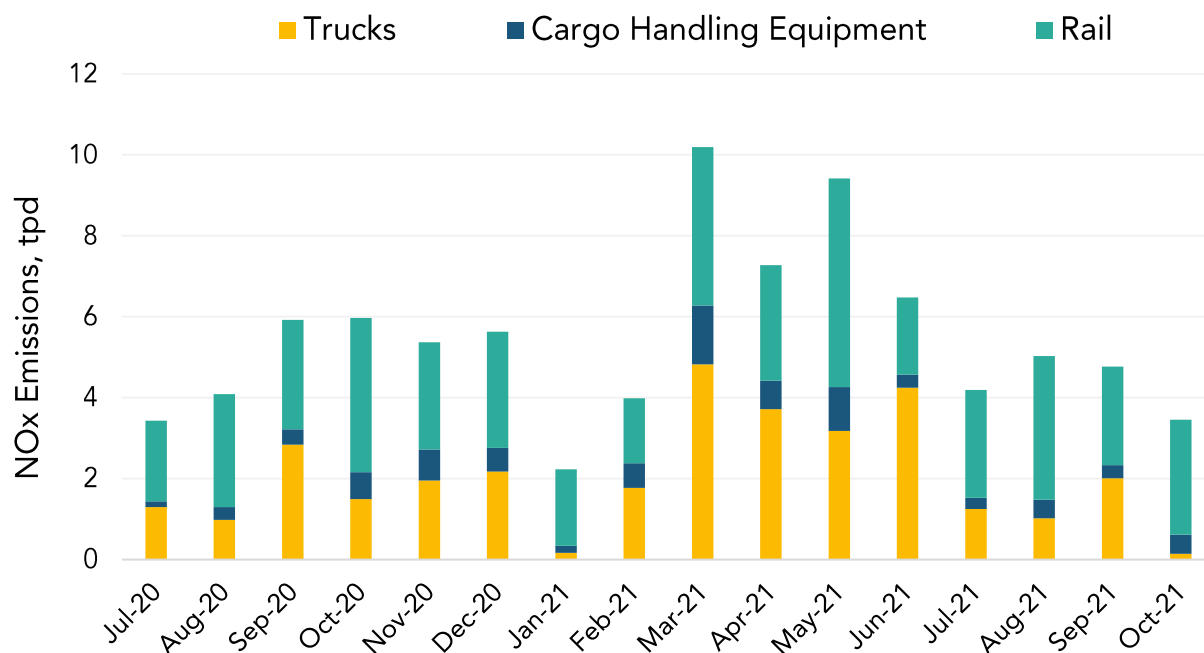
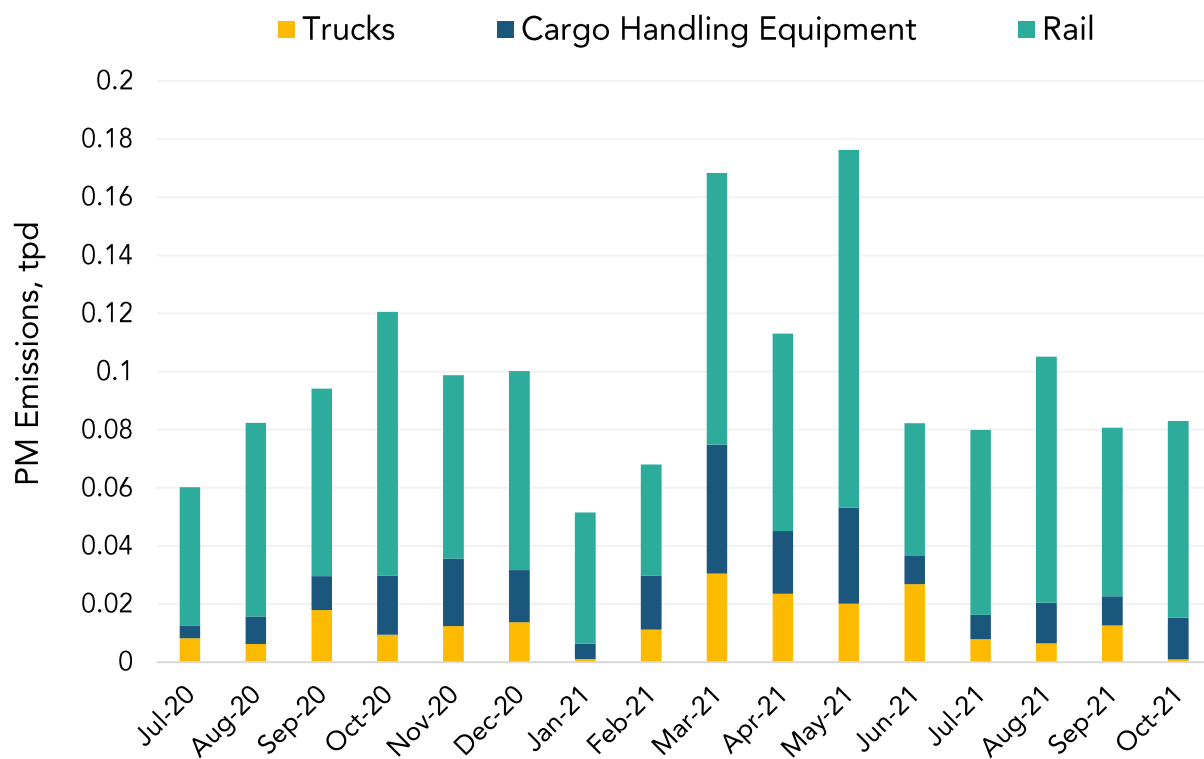


Figure 4. PM Emissions from Freight Movement by Trucks, Rail, and Cargo Handling Equipment near the San Pedro Bay Ports



Background

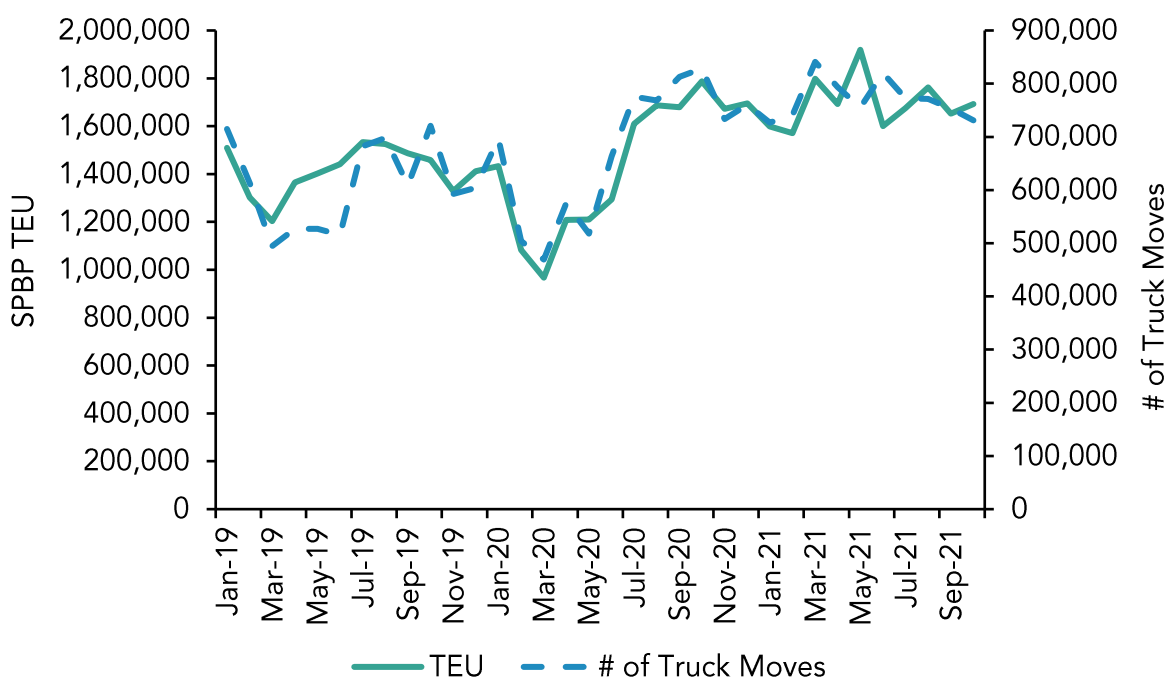
- CARB’s current emissions estimate from EMFAC2021⁵ shows the following emission from freight related categories in a business-as-usual case, without the recent increase in freight movement.

Table 3: Baseline Emissions from Freight-Movement Sources in South Coast Air Basin

Source	NOx Emissions (tpd)	PM Emissions (tpd)
Port Trucks	8.5	0.050
Rail	10.9	0.160
Cargo Handling Equipment	3.0	0.090

- According to truck traffic data provided by the San Pedro Bay Ports (SPBP), truck trips within SPBP are closely correlated with the monthly increase/decrease of cargo movement. Figure below shows a comparison of truck moves and TEU movement between January 2019 and October 2021. **This figure illustrates that changes in port trucks activity are highly correlated to cargo movement.** This also shows the increase in TEUs from 2019.

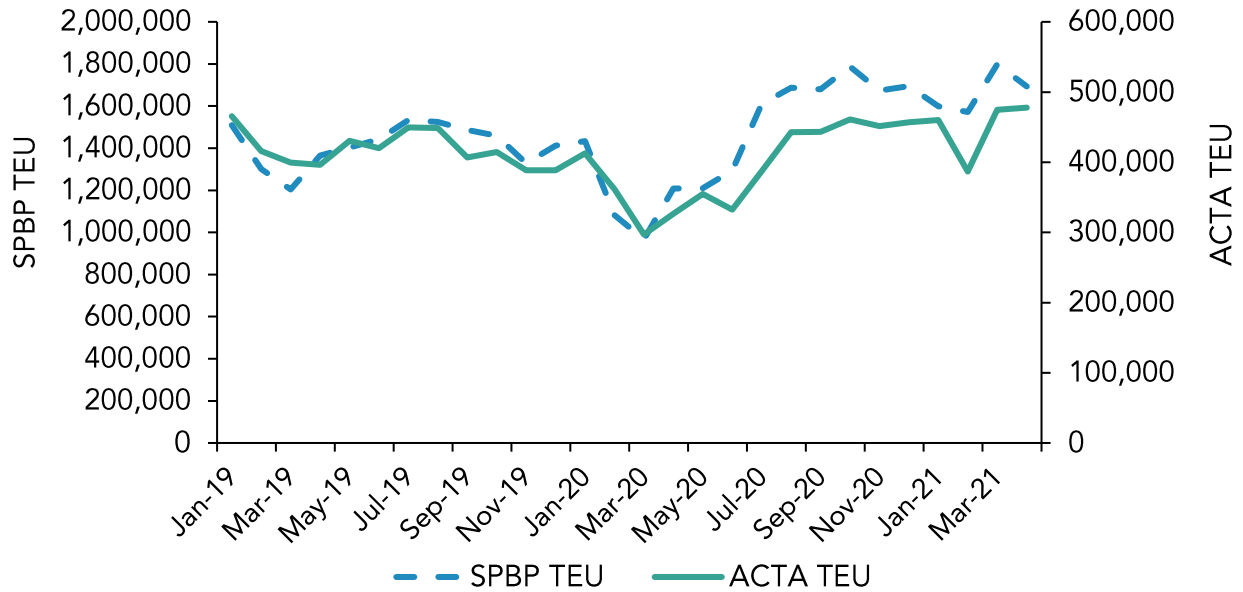
Figure 5. Comparison Between Truck Moves Data and TEU at the San Pedro Bay Ports



⁵ <https://arb.ca.gov/emfac/>

- The figure below shows a comparison of TEUs moved through the ports, and the number of TEUs reported by the Alameda Corridor Transportation Authority (ACTA), showing a strong correlation between rail activity and port TEUs.

Figure 6. Comparison Between San Pedro Bay Port and ACTA TEU Data



- According to the Marine Exchange of Southern California⁶, as of November 2021, there were as many as 86 container vessels (total of 114 vessels) at anchor near the SPBP.

Figure 7. Container Vessels at Anchor near the SPBP⁷

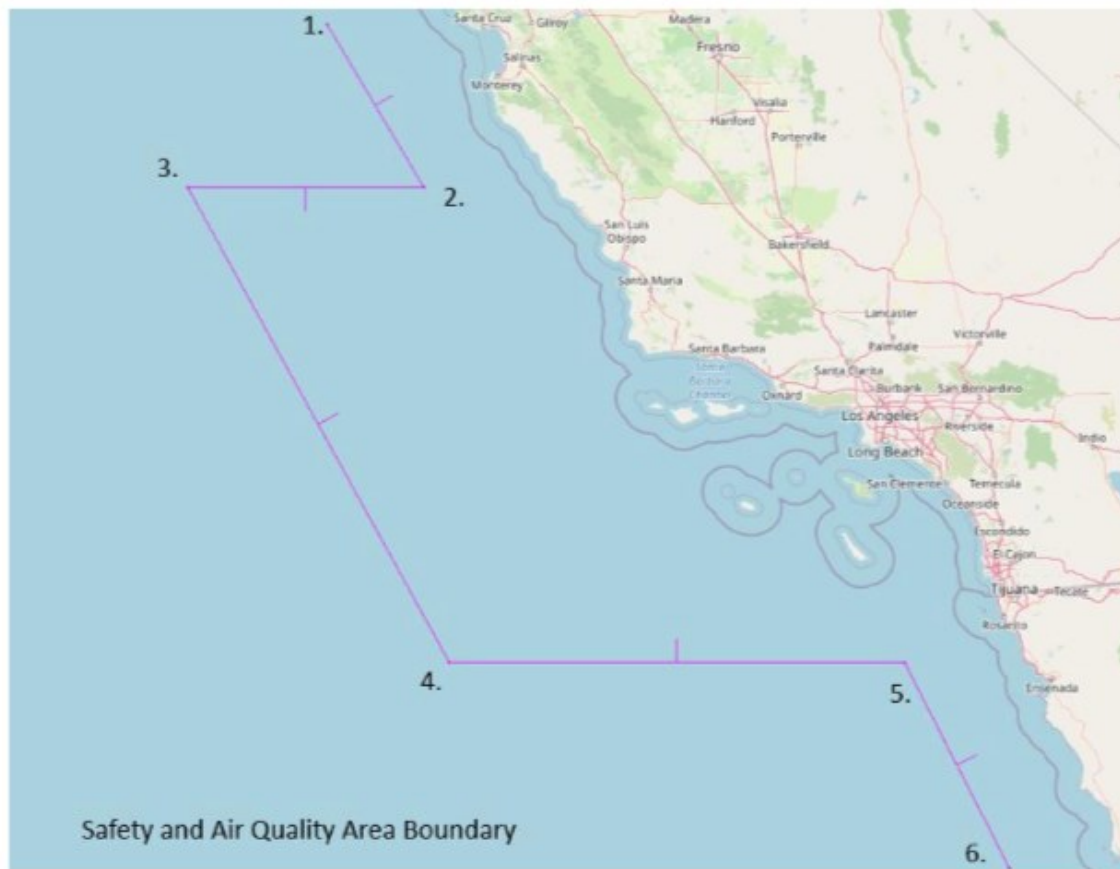


⁶ <https://mxsocal.org/>

⁷ Courtesy of MXSOCAL: <https://twitter.com/MXSOCAL/status/1461131291223478273/photo/1>

- To put the general magnitude of emissions into context, a 20 tpd increase in NO_x emissions from containerships at anchor is equivalent to almost 20 percent of the additional 108 tpd NO_x reductions needed to attain the 80 ppb ozone standard in the South Coast Air Basin by 2023. A 20 tpd increase in NO_x emissions is roughly equivalent to the total emissions from 5.8 million passenger cars in South Coast. Additionally, the equivalent increased diesel PM emissions is comparable to the exhaust PM emissions from almost 100,000 Class 8 diesel trucks.
- **New Queue System:** The peak of container vessel anchored has decreased from mid-November 2021, at least in part due to the new queueing system from PacMSS. The system allows vessels to wait either 150-miles off the shore in designated areas, or simply to arrive closer to their designated arrival date by slowing transit speeds across the Pacific, or waiting in alternate areas. The following figure illustrate the 150-mile boundary west of Southern California defined by PacMMS.

Figure 8. Newly Implemented Queuing Area Developed by Marine Exchange of Southern California⁸.



⁸ <http://pacmms.org/wp-content/uploads/2021/11/QueuingProcess.pdf>