

**CARB Staff Analysis of Potential Emission Reduction Strategies by Port/Terminal/Berth
For Passenger Vessels
May 2019**

The berth analysis is an assessment made by California Air Resources Board (CARB) staff to characterize what additional shore power infrastructure improvements may be necessary for passenger (cruise) vessels to support the new draft At Berth and At Anchor (new draft At Berth) Regulation. For the development of the analysis CARB staff relied on port maps, Google Earth maps, and vessel visit information from Wharfinger, San Francisco Marine Exchange, and California State Lands Commission data. CARB staff's assessment was based on comment letters received from industry stakeholders in response to the new draft At Berth Regulation, numerous port/terminal site visits and tours, extensive discussions with terminal operators, Port staff throughout the state, and harbor pilots servicing the Northern and Southern California Ports.

The assessment is also intended to assist CARB staff to estimate the potential cost impacts that could be incurred due to infrastructure and/or equipment upgrades as a result of the requirements of the new draft At Berth Regulation.

If you have any comments, feedback and/or updated information we would welcome additional information to further refine this analysis. Please submit your feedback to CARB via email to Nicole Light (nicole.light@arb.ca.gov) or Lynsay Carmichael (lynsay.carmichael@arb.ca.gov).

Legend:

SP= shore power

Subject Headers:

- **Total # of Cruise Visits in 2017** = Total number of passenger/cruise vessel visits by berth based on 2017 visit information (visit information includes vessel visits made by vessels subject to the existing At-Berth Regulation and unregulated vessels)
- **# of Currently Unregulated Cruise Vessels visiting Terminals in 2017** = Number of passenger/cruise vessels currently not subject to the existing At-Berth Regulation
- **# of Anticipated Newly Regulated Vessel Visits** = Number of visits made by passenger/cruise vessel currently not subject to the existing At-Berth Regulation
- **# of Existing Vaults** = Number of existing land-side vaults installed (to connect vessel-based shore power to land-side shore power)
- **Additional SP Infrastructure Needed?** = Staff's estimates of potential infrastructure needs based on number of vessels that are currently not subject to the existing At-Berth Regulation and vessels that are currently subject to the regulation but will be required to meet vessel visit requirements once the new At Berth Regulation becomes effective
- **Reasoning** = Basis for CARB staff analysis and assumptions

Berth Level CARB Staff Analysis of Potential Emission Reduction Strategies

May 2019

Port/Terminal/Berth	Total # of Cruise Visits in 2017	# of Anticipated Newly Regulated Vessel Visits	# of Existing Vaults	Additional SP Infrastructure Needed?	Reasoning
Long Beach	256	0	1	No	Port of LB has one cruise berth and it is already SP capable.
Cruise Terminal	256	0	1	No	Terminal has one berth, with SP already installed.
Berth H4	256	0	1	No	Berth has SP
Los Angeles	101	22	6	No	Port of LA cruise terminal can plug vessels into SP at both berths at the same time.
World Cruise Terminal	101	22	6	No	Terminal has two active berths, with SP already installed at both berths. Can plug two vessels in at the same time.
Berth 92	27	22	4	No	Berth has two 11 kV AMP vault connections and two 6.6 kV vault connections.
Berth 93A	74		2	No	Berth has two 11 kV AMP vault connections.
One berth used 83 days of the year, two berths used at same time 15 days of the year (in 2017)					
San Diego	89	16	3	No	Port of San Diego can plug in one cruise vessel at a time. Assumption is that Port of San Diego will not install additional power to plug in multiple vessels simultaneously, but that assumption may change if updated information is recieved from the Port.
B Street Pier	81	16	2	No	Port has two terminals B Street (5 berths, with two SP connection points) and Broadway (2 berths, with one SP connection point). The port only has enough power to plug in one vessel at a time, either B-Street OR Broadway, but not at both simultaneously.
North Berth (B-1 and B-2)	14		1		
South Berth (B-4 and B-5)	45	16	1	No	B Street Pier has five berths located on the North, South and West sides of the pier, The North and South side each have one shore power connection point (services both berths). Only one cruise vessel is capable of plugging in at the port at a time.
Broadway Pier	22		1		
Broadway Pier	0		1	No	This pier already has SP and limited vessel activity.
Broadway Pier	8	0	1	No	
Broadway Berth	8	0	1	No	Broadway Terminal has one connection point, with limited activity in 2017. Only one cruise vessel is capable of plugging in at the port at a time.
One berth used 71 days of the year, two berths used at same time 11 days of the year, three berths used at same time 2 days of the year (in 2017)					

Berth Level CARB Staff Analysis of Potential Emission Reduction Strategies

May 2019

Port/Terminal/Berth	Total # of Cruise Visits in 2017	# of Anticipated Newly Regulated Vessel Visits	# of Existing Vaults	Additional SP Infrastructure Needed?	Reasoning
San Francisco	81	18	1	Potentially one additional shore power berth	Port of San Francisco operates cruise terminals at two Piers - Pier 27 and Pier 35. Pier 27 has SP infrastructure, but Pier 35 does not have SP infrastructure. Staff assumes that the currently unregulated vessels will be outfitted with SP to comply, and that the number of vessels calling multiple berths on the same day will likely increase, which will result in the port needing an additional shore power berth.
Cruise Terminal	81	18	1	Potentially one additional shore power berth	The cruise terminal has one SP berth currently and staff assumes they will need one additional SP berth at their terminal.
Pier 27	66		1	No	Pier 27 has one berth, with a SP vault already installed.
Pier 35 (North and South Berths)	15	18	None	Potentially one additional shore power berth	Pier 35 has two berths (north and south), and is typically used as an overflow berth. Pier 35 does not have any SP infrastructure.
One berth used 78 days of the year, two berths used at same time 14 days of the year (in 2017)					

	Total # of Cruise Visits in 2017	# of Anticipated Newly Regulated Vessel Visits	# of Existing Vaults	Additional SP Infrastructure Needed?
Statewide #'s	527	56	11	1 potential new shore power installation

1 CARB staff assume SP will be control technology pathway for each cruise terminal. No C+C assumed for cruise vessels.

2 Pier 35 is only cruise berth at a currently regulated Port without any SP infrastructure installed.