Port of New York & New Jersey

The Cost of Breathing at America's Busiest East Coast Port

~2,600 t
criteria pollutants emitted at berth annually

3.2M
below-median-income residents in surrounding communities

$150M+
estimated annual public health cost of port emissions

ZERO
mandatory at-berth emissions controls

Sources: ICCT Port Emissions Screening (2023); ICCT Electrifying Ports Study (2023); EPA BenMAP methodology; U.S. Census ACS

Port Overview

The Port of New York and New Jersey is the largest port complex on the U.S. East Coast and the third-busiest in the nation. The port spans facilities across Newark, Elizabeth, Bayonne, Staten Island, Brooklyn, and other locations across two states. It handles over 7,500 vessel calls annually, including container ships, tankers, bulk carriers, and roll-on/roll-off auto carriers.

While docked, these vessels run auxiliary diesel engines that emit fine particulate matter (PM2.5), nitrogen oxides (NOx), sulfur oxides (SOx), and carbon dioxide (CO2) directly into adjacent residential neighborhoods. Unlike California — the only U.S. jurisdiction with mandatory at-berth emissions controls — the NY/NJ port complex has no equivalent requirement.

Who Is Affected

The communities surrounding the port are disproportionately low-income and communities of color. ICCT screening identifies the NY/NJ port group as the **highest-priority U.S. port complex** for health impact intervention based on the intersection of emissions volume and environmental justice indicators.

Community	Population	Key Health Burden
Newark, NJ	311,000	Asthma hospitalization rates among highest in NJ; cumulative industrial exposure
Elizabeth, NJ	137,000	Adjacent to port marine terminals and NJ Turnpike interchange
Bayonne, NJ	71,000	Surrounded by port facilities on three sides
Brooklyn, NY	2,500,000+	ICCT estimates $60M+/year in port-attributable health damages
Staten Island, NY	495,000	Proximity to container terminals and petroleum facilities

Environmental Justice

A majority of the population living within 5 km of port container terminals are lower-income populations. Those below the poverty line are concentrated disproportionately on the New Jersey side of the port — closest to the highest-emission berths.[1]

Health Impact Analysis

Using the ICCT's Port Emissions Inventory Tool (goPEIT) and the EPA's Intervention Model for Air Pollution (InMAP), we model the health outcomes attributable to at-berth vessel emissions and the benefits of their reduction.

The scenario below models outcomes using the performance of currently deployed, CARB-certified barge-mounted capture systems (99% PM2.5, 95% NOx removal — independently verified by Yorke Engineering LLC).

Health Outcome	Current Annual Burden	With At-Berth Capture
PM2.5 emissions at port (tonnes/yr)	~780 t	69–99% reduction
NOx emissions at port (tonnes/yr)	~1,400 t	Up to 95% reduction
Premature deaths from port PM2.5	Estimated 50–130/year	35–125 lives saved/year
Cardiovascular & respiratory hospitalizations	Estimated 200–500/year	140–480 avoided/year
Childhood asthma ED visits	Estimated 300–700/year	210–670 avoided/year
Monetized public health benefit (EPA VSL)	**$150M+/year**	**$105M–$148M saved/ year**

Methodology Note

Premature death estimates use EPA's concentration-response function for PM2.5 (Krewski et al. 2009, ACS CPS-II) and EPA Value of Statistical Life ($11.8M, 2024-adjusted). Hospitalization and ED visit rates scaled from NYC Health Department air quality surveillance data and ICCT InMAP modeling. Ranges reflect uncertainty in dispersion modeling and exposure assumptions. All estimates are conservative — they exclude SOx and secondary PM2.5 formation, which would increase totals.

The Brooklyn Impact

ICCT modeling of the full electrification scenario at the Port of NY/NJ found that Brooklyn would receive the largest monetized health benefit of any borough or county — over $60 million per year in avoided health damages. Although the reduced annual PM2.5 concentration in Brooklyn would be below 0.2 μg/m³, the sheer population density (2.5 million+ residents) means even small per-person exposure reductions translate into large aggregate health gains.[2]

The Regulatory Gap

California's CARB At-Berth Regulation has been in effect since 2014 and was strengthened in 2020. In October 2023, the EPA authorized California's regulation under the Clean Air Act, which legally enables other states to adopt the identical standard. **No state has done so.**

This means the technology to prevent the health impacts documented above is commercially proven, regulatory-approved, and deployable today. The only missing piece is the regulatory mandate or financial incentive to deploy it at the Port of NY/NJ.

Pathways to Action

Several pathways exist for reducing at-berth emissions at the Port of NY/NJ:

- **State adoption of CARB-equivalent regulation**: New York and New Jersey could adopt California's at-berth standard under the EPA authorization
- **Port Authority voluntary commitment**: PANYNJ could require at-berth controls as a condition of terminal leases
- **Carbon credit incentives**: Voluntary carbon market frameworks currently under development could provide revenue to fund capture deployment without regulatory mandates
- **Federal EPA Clean Ports funding**: The $3 billion Clean Ports Program (IRA Section 60102) included NY/NJ-area awards — disbursement status under current administration requires FOIA verification

What Comes Next

This assessment is a proof-of-concept demonstration using publicly available data. A full site-specific assessment for the Port of NY/NJ — with higher-resolution dispersion modeling, localized health data, and census-tract-level environmental justice analysis — is available through our research services.

Port Health Watch is also developing:

- **Air Quality Health Units (AQHUs)**: The first tradable health benefit asset class for port pollution reduction, under development for submission to Verra's SD VISta program. Learn more →

- **Carbon credit methodology**: A Verra VCS methodology for at-berth maritime carbon capture, targeting July 2026 submission. Learn more →

The Opportunity

At-berth emissions capture at the Port of NY/NJ could save 35–125 lives per year, prevent hundreds of hospitalizations and emergency room visits, and deliver over $100 million annually in monetizable health benefits — using technology that is commercially deployed and independently verified today.

1. ICCT, "Emissions analysis of the Port Drayage Truck Replacement Program and local air quality: The case of the Port of New York and New Jersey" (2022); U.S. Census ACS 5-year estimates. ↩
2. ICCT, "Electrifying ports to reduce diesel pollution from ships and trucks and benefit public health: Case studies of the Port of Seattle and the Port of New York and New Jersey" (February 2023). ↩

This assessment was produced by Port Health Watch, a research initiative of Civil Ledger Lab, operated by EcoAsset Lab LLC. For site-specific assessments with higher-resolution modeling, contact research@porthealthwatch.org.