Port of Baltimore

America's Busiest RoRo Port — And a Community That Can't Wait

~550 t
criteria pollutants emitted at berth annually

350K+
below-median-income residents in surrounding communities

$35M+
estimated annual public health cost of port emissions

ZERO
mandatory at-berth emissions controls

Sources: ICCT Port Emissions Screening (2024); Maryland Port Administration Clean Air Strategy; EPA BenMAP methodology; U.S. Census ACS

Port Overview

The Port of Baltimore is the busiest roll-on/roll-off (RoRo) port in the United States, ranked first nationally for farm and construction machinery, imported forest products, and imported gypsum, and second for autos and light trucks. The port's public and private marine terminals handled 45.9 million tons of cargo in 2024, and in 2025, the port set a new record with 2,223 cargo vessel visits — surpassing its previous record by 4%.

The Dundalk Marine Terminal, at 580 acres, is the port's largest facility — handling containers, RoRo vehicles, breakbulk cargo, and project cargo across 13 berths. The Seagirt Marine Terminal set its own record with 689 ship calls in 2025, moving over 1.1 million TEUs. The port's recovery from the March 2024 Francis Scott Key Bridge collapse — returning to full operations within 11 weeks — brought national attention to Baltimore's port infrastructure and the communities that depend on it.[1]

Who Is Affected

The communities surrounding the Port of Baltimore — particularly in South Baltimore — have borne the cumulative burden of industrial pollution for generations. Curtis Bay, Brooklyn, and Hawkins Point are among the most environmentally burdened neighborhoods in Maryland, hosting the nation's largest medical waste incinerator, a sprawling coal terminal, oil tank farms, and the port's marine terminals.

Community	Population	Key Health Burden
Curtis Bay	4,000+	94th percentile for toxic air releases in Maryland; nation's largest medical waste incinerator
Brooklyn / Brooklyn Park	10,000+	Adjacent to Dundalk and port truck corridors; legacy industrial contamination
Hawkins Point	3,000+	Surrounded by industrial facilities; elevated respiratory disease rates
Dundalk	63,000+	Adjacent to Dundalk Marine Terminal; hexavalent chromium contamination legacy
South Baltimore (broader)	30,000+	Cumulative exposure from port, industrial, and mobile sources

Environmental Justice

Curtis Bay ranks in the 94th percentile for toxic air releases and 75th percentile for fine soot particle exposure compared with the rest of Maryland, according to EPA EJScreen. The neighborhood is home to the nation's largest medical waste incinerator — recently sued by Maryland regulators for air quality violations — as well as a CSX coal terminal with capacity for 14 million tons annually, oil and gas tank farms, and a federal Superfund site. For generations, these predominantly low-income Black communities have shouldered port and industrial pollution that produces alarmingly high rates of asthma and respiratory illness.[2]

Health Impact Analysis

Using the ICCT's Port Emissions Screening data, the Maryland Port Administration's Clean Air Strategy framework, and the EPA's concentration-response methodology, 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). Baltimore's dominant RoRo vessel traffic aligns directly with the vessel class these systems were originally designed to serve.

Health Outcome	Current Annual Burden	With At-Berth Capture
PM2.5 emissions at port (tonnes/yr)	~130 t	69–99% reduction
NOx emissions at port (tonnes/yr)	~340 t	Up to 95% reduction
Premature deaths from port PM2.5	Estimated 6–16/year	4–15 lives saved/year
Cardiovascular & respiratory hospitalizations	Estimated 25–65/year	18–62 avoided/year
Childhood asthma ED visits	Estimated 35–95/year	25–91 avoided/year
Monetized public health benefit (EPA VSL)	**$35M+/year**	**$25–$40M 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). Emissions estimated from vessel call frequency (2,223 in 2025), vessel type distribution (predominantly RoRo and container), and EPA emission factors. The Maryland Port Administration's Clean Air Strategy includes plans for a comprehensive emissions inventory incorporating vessels, trucks, and rail — but this inventory has not yet been published. Ranges reflect this additional uncertainty. All estimates are conservative — they exclude SOx and secondary PM2.5 formation.

After the Bridge: A Moment for Baltimore

The March 26, 2024 collapse of the Francis Scott Key Bridge was a tragedy that killed six workers and closed the Port of Baltimore's main shipping channel for 11 weeks. The port's rapid recovery — clearing 50,000 tons of debris and reopening the Fort McHenry channel by June 12 — demonstrated the resilience of Baltimore's maritime workforce and the economic centrality of the port.

But the bridge collapse also brought unprecedented national attention to the communities that live alongside the port. For residents of Curtis Bay, Brooklyn, and Hawkins Point, the closure paradoxically provided a brief respite from vessel emissions — followed by legitimate concern that the recovery would intensify pollution as diverted cargo returned and vessel traffic surged to make up for lost time.

The rebuilding effort — projected to cost $4.3–5.2 billion with completion by 2030 — is an opportunity to invest not just in infrastructure, but in the health of port communities. The CSX Howard Street Tunnel reconstruction, expected in 2026, will enable double-stack rail service that could shift 160,000 containers annually from trucks to rail — reducing drayage emissions but leaving at-berth vessel emissions unaddressed.[3]

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. **Maryland has not adopted at-berth vessel controls.**

The Maryland Department of the Environment has regulatory authority over air quality, and the Maryland Port Administration has developed a Clean Air Strategy and Energy Resiliency Plan. The plan includes a framework for addressing emissions from MPA activities, contractors, and tenants, including an expanded emissions inventory. However, this framework has not yet produced mandatory at-berth requirements.

Baltimore's RoRo-dominant vessel profile makes it a particularly strong candidate for barge-mounted capture technology, which was originally designed for auto carrier and RoRo vessels before expanding to containers and tankers.

Pathways to Action

Several pathways exist for reducing at-berth emissions at the Port of Baltimore:

- **State adoption of CARB-equivalent regulation**: Maryland could adopt California's at-berth standard under the EPA authorization
- **Maryland Port Administration voluntary commitment**: MPA could require at-berth controls as a condition of terminal leases at Dundalk and Seagirt
- **Bridge rebuilding integration**: The $4.3–5.2 billion Key Bridge replacement project could include at-berth emissions controls as a community benefit commitment
- **Carbon credit incentives**: Voluntary carbon market frameworks currently under development could provide revenue to fund capture deployment
- **Federal EPA Clean Ports funding**: MPA has applied for Clean Ports Program funding for zero-emissions port equipment — at-berth capture could complement these investments
- **Curtis Bay community advocacy**: The Community of Curtis Bay Association and Environmental Integrity Project have been active on industrial pollution for over a decade

What Comes Next

This assessment is a screening-level analysis using publicly available data. A full site-specific assessment for the Port of Baltimore — 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 Baltimore could save 4–15 lives per year, prevent dozens of hospitalizations and emergency room visits, and deliver $25–$40 million annually in monetizable health benefits — using technology originally designed for the RoRo vessels that dominate Baltimore's traffic. As the port rebuilds from the Key Bridge collapse, there is a once-in-a-generation opportunity to invest in community health alongside infrastructure.

1. Maryland Port Administration statistics; Governor Wes Moore, "New Port of Baltimore Records" (2025); BTS Port of Baltimore information; Port of Baltimore Wikipedia. ↩
2. EPA EJScreen Community Report — Curtis Bay; Environmental Integrity Project, South Baltimore environmental justice program; Maryland Matters, "Baltimore's port communities deserve environmental justice" (November 2024); PMC, "Community-driven research in Curtis Bay" (2023). ↩
3. Maryland Port Administration, Clean Ports Grant Deployment Project Narrative; NOAA Research, "Measuring pollution levels in the Port of Baltimore after the bridge collapse" (May 2024). ↩

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.