

# Addressing Freight Pollution at the Source

## *Air Pollution, Freight Facility Clusters, and the Role of Indirect Source Rules*

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### HIGHLIGHTS

*Nationwide, over 66 million people—nearly one in five people in the United States—live near freight facilities and corridors. Growth in e-commerce has driven the construction of larger, increasingly clustered warehouses, and UCS research shows that higher concentrations of nearby warehouses are associated with greater environmental and health impacts in freight-adjacent areas. Because the US freight system largely runs on fossil fuels that pollute the air, people living around freight facilities and corridors are often exposed to elevated levels of harmful pollutants. Public health issues resulting from exposure include chronic and lethal illnesses that disproportionately affect people of color and people with lower incomes.*

*But indirect source rules (ISRs) for freight hubs can reduce emissions in the near term and direct investments to the people most burdened by freight pollution. This policy tool requires facilities that are pollution sources to begin to address pollution attracted by their operations.*

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# Introduction

The nation’s freight system has long exposed people living and working near major ports, railyards, and warehouses to significant and disproportionate levels of air pollution. Nationwide, over 66 million people—nearly one in five people in the United States—live near freight facilities and corridors. Their communities continue to suffer despite meaningful reductions in exposure to transportation pollution in recent decades (Koolik et al. 2024; Wilson 2025).

Rising consumption and shifts in consumer patterns, including the growth of e-commerce, are driving the rise in freight volumes, along with the proliferation of clustered mega-warehouses and growth in heavy-duty truck operations and vehicle miles traveled. These freight trends, combined with current federal efforts to forestall state and federal clean truck and engine policies and programs, threaten to erode decades of progress toward reducing negative health outcomes from exposure to toxic air pollution from transportation.

Indirect Source Rules (ISRs) offer state and local governments an opportunity to continue addressing the harmful impacts of freight pollution as well as to sustain progress toward the broader pollution reductions delivered by zero-emission freight. A promising policy tool, ISRs require facilities to address the “indirect” emissions from the pollution sources—like trucks visiting ports and warehouses—that their operations attract. Indirect emissions differ from “direct” or point-source emissions (e.g., from smokestacks). ISRs apply not only to freight facilities, as discussed here, but also to construction projects, parking facilities, and other sources of indirect pollution.

To highlight the need for freight-focused ISRs, the Union of Concerned Scientists (UCS) conducted a high-resolution spatial analysis of populations living near freight facilities. We found clear relationships between growing concentration of freight facilities and pollution concentrations in nearby communities. This analysis also showed clear relationships between growing clusters of freight facilities and the share of people of color living in nearby communities. Further, in concert with the spatial analysis, UCS identified best-practice ISR policy design elements and reviewed existing and potential compliance options that could lead to sustainable reductions in air pollution in freight-adjacent communities.

# Pollution and the US Freight System

The US freight system, a complex international system of centralized hubs and radial spokes, relies on trucks, trains, transoceanic ships, and other vehicles and equipment to move billions of tons of freight millions of miles annually as goods make their way to both producers and consumers (BTS 2017). These vehicles typically begin or end their journeys at the ports, warehouses, and railyards that serve as the primary hubs in the freight system, receiving, shipping, sorting, and storing goods.

This system runs largely on fossil fuels that pollute the air, harming both people and the planet. It often exposes people living around freight facilities and corridors to elevated levels of harmful air pollutants, including diesel particulate matter (DPM) and ground-level ozone. The results include higher instances of cancers, cardiovascular and pulmonary diseases, and other illnesses (Brantley et al. 2019; Ducruet et al. 2024; deSouza et al. 2022; Kerr et al. 2024; Yang et al. 2024). And given that freight-adjacent populations are often majority low income and communities of color, freight pollution exacerbates existing equity issues.

The rise in e-commerce over the past several decades—which accelerated during and following the COVID-19 pandemic—has not only reshaped consumption patterns but has also fundamentally altered the freight system that underpins the movement of goods (Alcedo et al. 2024; Wilson 2023a). While the e-commerce model has introduced some systemic efficiencies, it also drives increased activity at freight facilities (Rodrigue 2020). This, in turn, threatens the meaningful progress made in recent decades toward reducing exposure to harmful pollution from freight operations, particularly in areas already burdened by historically high air pollution (Colmer et al. 2020; Koolik et al. 2024; Shen and Reichmuth 2022).

## Ports and Railyards

Both coastal and inland ports are significant drivers of local and regional air pollution, attracting freight trains, transoceanic ships, other marine vessels, and an ever-increasing number of trucks (Mueller et al. 2023). Operations at and influenced by the ports of Los Angeles and Long Beach, for example, are responsible for about 13 percent of DPM and just under 10 percent of emissions of nitrous oxides (NO<sub>x</sub>) across California's South Coast Air Basin (Port of LA 2025; Port of LB 2025). Supporting vehicles and equipment, such as tugboats, switcher locomotives, yard trucks, and cargo handling equipment, also contribute significantly to pollution from port operations. In 2023, nearly 40 million shipping containers moved through the top 25 US container ports; the top five ports—Los Angeles, Long Beach, New York/New Jersey, Savannah, and Houston—moved around 60 percent of containers (BTS n.d.a).

Port operations and emissions are often as diverse as the regions they serve, with ships contributing significantly to coastal ports and freight trains to inland ports. That said, pollution from heavy-duty trucks is a common denominator among all freight facilities. Trucks move most freight, whether bulk or containerized, somewhere along its journey. In 2024, trucks moved around 13 billion tons of freight, an amount estimated to increase by around 50 percent to over 19 billion tons by mid-century (BTS 2017). Each year, exposure to pollution from heavy-duty vehicles results in thousands of premature deaths and nearly \$100 billion in public health costs (Cooke 2026).

## Warehouses

Warehouses are typical waypoints for goods as they make their way from ports and railyards to consumers. Nearly 60,000 large warehouses, distribution centers, and truck terminals are in operation across the nation.<sup>1</sup> Recent decades have seen a sizable uptick in the construction of significantly larger warehouses, as well as a four-fold increase in the number of loading docks at new warehouses and increased clustering of these new facilities. Today, the median size of warehouses is three times that of warehouses constructed in the early 1980s (Kerr et al. 2024).

Warehouses are often highly concentrated near major metropolitan areas, which offer existing industrial and logistics infrastructure (e.g., ports, railyards) (see Figure 1). In these locations, their operations both attract and create a significant amount of air pollution (see Appendix) (Yang et al. 2024; Giuliano et al. 2016). In freight-adjacent neighborhoods, this exacerbates cumulative impacts resulting from air pollution, water, traffic, noise and light pollution, and infrastructure wear and tear (deSouza et al. 2022; Shen 2025).

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Figure 1. Residences Adjacent to Major Freight Facilities



*This complex of large logistics and fulfillment warehouses and an intermodal rail yard near Richmond, California are located adjacent to residential neighborhoods. Although not pictured here, this warehouse complex also abuts an elementary school. These facilities often contribute significantly to local air pollution by attracting tractor trucks and locomotives as well as the use of cargo handling equipment. (Source: UCS)*

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<sup>1</sup> UCS acquired information on warehouse, distribution centers, and truck terminals from CoStar, a proprietary dataset for commercial properties worldwide. This report considered warehouses over 100,000 square feet and distribution centers and truck terminals over 20,000 square feet. Methodology for UCS's population proximity analysis can be accessed at [www.ucs.org/resources/addressing-freight-pollution-source](http://www.ucs.org/resources/addressing-freight-pollution-source).

# Freight-Adjacent Populations and Pollution

To better understand how the concentration of freight facilities affects pollution burdens, our high-resolution population proximity analysis combined data on the locations of large freight facilities with high-resolution population data. This enabled us to identify populations living near freight facilities and corridors. We then applied environmental and public health data from the Centers for Disease Control to compare how exposure to air pollution and cancer risks in these communities compare with the national average and how impacts change based on the number of nearby freight facilities (CDC 2024).

*Our analysis identified 66.4 million people across the contiguous United States living near large freight facilities and corridors. These include residents living within 500 meters of freight corridors and single large warehouses, distribution centers, or truck terminals or within 1,000 meters of ports, railyards, or freight facility clusters.*

*Further, we found that environmental and health burdens tend to increase as concentrations of nearby freight facilities increase. Freight-adjacent populations are often exposed to elevated concentrations of DPM, NO<sub>x</sub>, and fine particulate matter (PM<sub>2.5</sub>) (Chakraborty et al. 2011; Kerr et al. 2024; Levasseur et al. 2026; Zhou and Levy 2007).*

*Freight-adjacent communities are often majority people of color. Our research found that, on average, nearly 80 percent of the people who live in areas close to more than 10 freight facilities are people of color, even though people of color make up only about 40 percent of the US population.*

## State and County Patterns in Freight Facility Concentrations

States with the highest share of freight-adjacent populations tend to be those with large shares of urban residents and that are also home to major international container ports (Table 1). The nation's three largest container ports are in California and New Jersey—where 27 and 31 percent of residents, respectively, live near freight facilities and corridors (Census Bureau n.d.). Hudson County, New Jersey, home to container terminals supporting the Port of New York and New Jersey, has the highest concentration of large warehouses by land area nationwide, with over *five warehouses per square mile*. The county also has the highest share of freight-adjacent population among highly populated counties—*over 70 percent of residents* (See Table 2 and Appendix Table A1 and Table A3).

Table 1. States with the Highest Shares of Populations Near Freight Facilities

	<b>Freight-Adjacent Population</b>	<b>State Population</b>	<b>Freight-Adjacent Population Share</b>
<b>New Jersey</b>	2,905,319	9,298,402	31.25%
<b>New York</b>	5,611,949	19,713,025	28.47%
<b>Illinois</b>	3,526,201	12,609,577	27.96%
<b>California</b>	10,632,085	39,125,347	27.17%
<b>Massachusetts</b>	1,770,939	7,025,465	25.21%

*New Jersey and New York have the highest shares of populations living close to major freight facilities, while California is home to the greatest number of freight-adjacent residents. Freight-adjacent populations include residents living near warehouses, ports, railyards, and freight corridors, as defined in the UCS population proximity analysis.*

Illinois does not have a major coastal port, but, as a national hub for rail freight, it is the fourth largest freight mover by tonnage: about one-quarter of all US freight trains move through the Chicago area (BTS n.d.b; CMAP, n.d.). Nearly 28 percent of Illinois residents—and over 40 percent of Cook County residents—live close to freight facilities and corridors (Table 1 and Table 2). Cook County is among the top 10 counties nationally by total number of large warehouses. Adjacent DuPage County ranks fifth nationally in the concentration of large warehouses by land area (see Appendix Table A1 and Table A2).

Table 2. Highly Populated Counties with Highest Shares of Near-Freight Populations

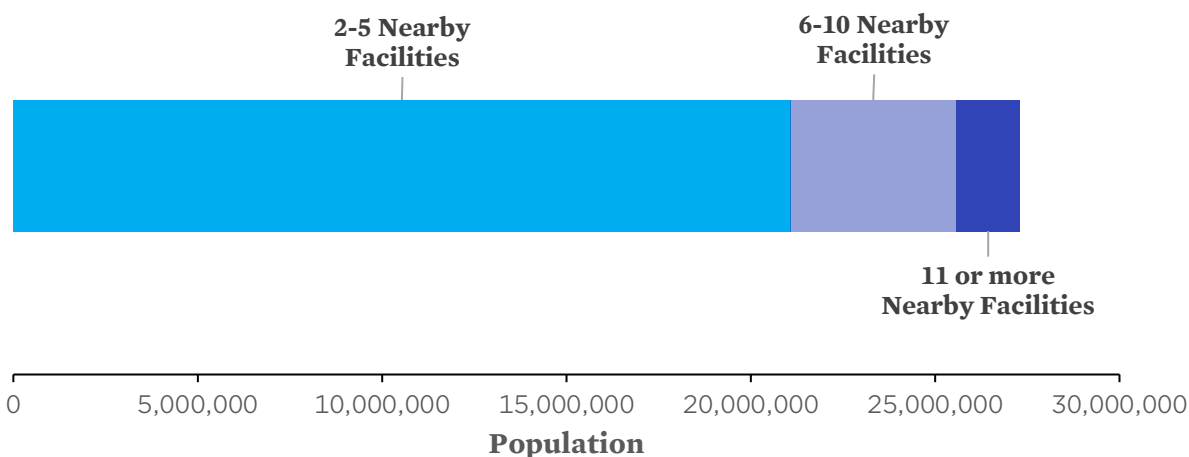
	<b>Freight-Adjacent Population</b>	<b>County Population</b>	<b>Share Freight-Adjacent</b>
<b>Hudson County, NJ</b>	521,096	736,185	70.78%
<b>St Louis County, MO</b>	176,813	279,695	63.22%
<b>Bronx County, NY</b>	775,573	1,384,724	56.01%
<b>Orleans Parish, LA</b>	199,120	362,701	54.90%
<b>Passaic County, NJ</b>	273,267	526,597	51.89%
<b>Union County, NJ</b>	293,272	594,160	49.36%
<b>Queens County, NY</b>	1,080,825	2,316,841	46.65%
<b>Philadelphia County, PA</b>	709,698	1,573,916	45.09%
<b>Milwaukee County, WI</b>	392,196	924,740	42.41%
<b>Cook County, IL</b>	2,192,869	5,182,617	42.31%

*Hudson County, New Jersey ranks highest among the highly populated counties (over 250,000 residents) with the largest share of population living in close proximity to major freight facilities. Freight-adjacent populations include residents near warehouses, ports, railyards, and freight corridors, as defined in the UCS population proximity analysis.*

## Freight Facility Clustering Exacerbates Air Quality Burdens

Of the over 66 million people living near freight facilities and corridors, around 27 million live close to two or more freight facilities, with over 1.7 million people living near more than 10 freight facilities (Figure 2). Previous research identified increased freight facility clustering in recent years, leading to increased local concentrations of air pollution (Kerr et al. 2024). However, research on how the size of freight hub clusters affects environmental, public health, and social burdens in freight-adjacent communities has been lacking. *Our analysis found that environmental and public health burdens from freight operations tend to increase as the size of nearby freight facility clusters grow.*

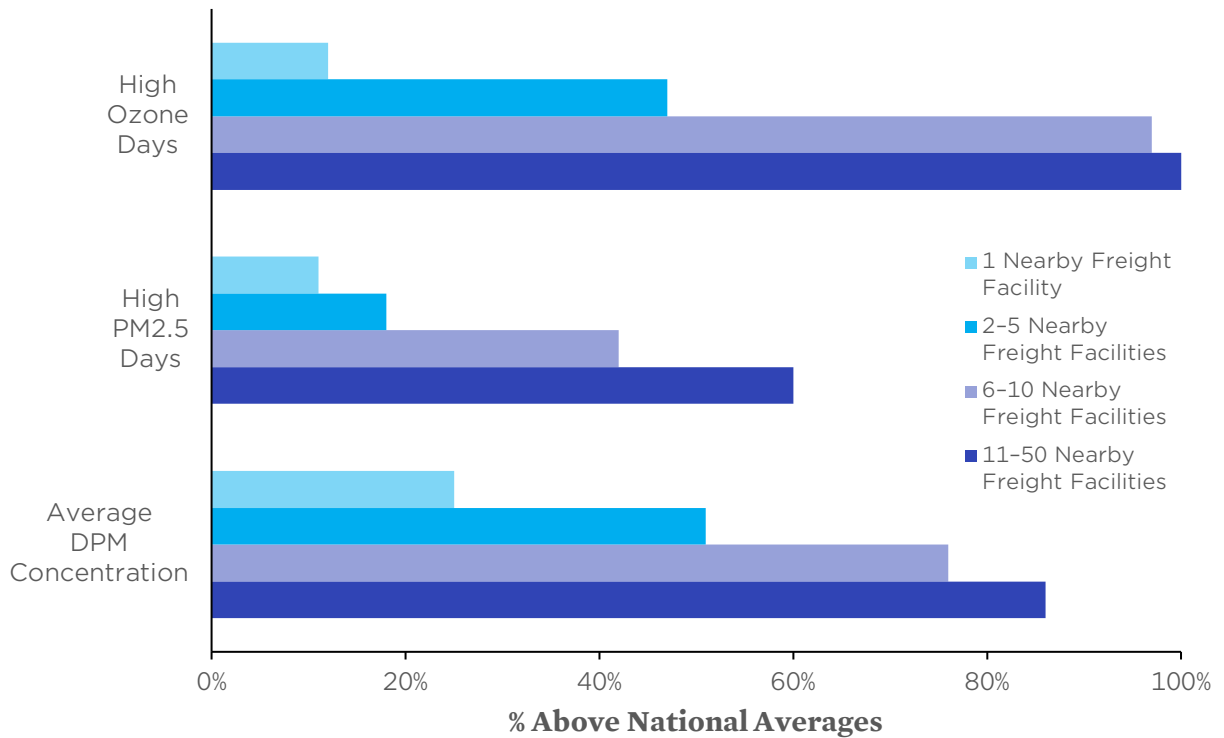
Figure 2. Population Near Freight Facility Clusters, Contiguous United States



*Over 27 million people across the contiguous United States live near two or more freight facilities, such as warehouses, ports, and railyards. Over 1.7 million people live close to more than 10 freight facilities. Key environmental and health burdens—such as diesel particulate matter concentrations, days with high levels of ozone and fine particulate matter, and heightened cancer risk from air toxics exposure—all increase with the concentration of nearby freight facilities.*

In census tracts close to clustered freight facilities, average concentrations of diesel particulate matter and days above national standards for PM<sub>2.5</sub> and ground-level ozone consistently rank higher than national averages. Moreover, these concentrations increase with greater concentrations of nearby freight facilities. Compared with the national average, areas close to more than 10 freight facilities experience average concentrations of DPM that are over 85 percent higher than national averages, just over twice as many days with ozone levels over national standards, and nearly 60 percent more days with PM<sub>2.5</sub> levels exceeding national standards (Figure 3).

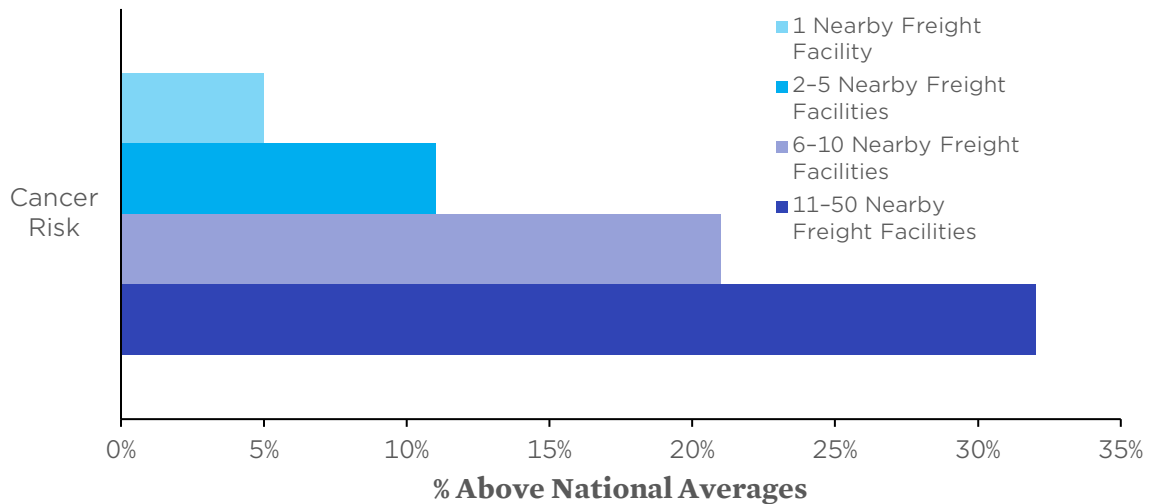
Figure 3. Pollution Indicators by the Number of Nearby Freight Facilities



*Compared with the national average, the concentration of DPM and the number of days with unhealthy levels of PM<sub>2.5</sub> and ground-level ozone are significantly higher in areas near freight facilities. These pollution indicators increase as the concentration of nearby freight facilities grows. On average, areas near more than five clustered freight facilities have about twice the national average of ozone exceedance days.*

The likelihood of developing cancer from exposure to air toxins is notably higher in areas close to clustered freight facilities. For example, the over 1.7 million people living in census tracts close to more than 10 freight facilities are 32 percent more likely to develop cancer from air toxics exposure compared with the national average (Figure 4). We found that populations living near just one freight hub had cancer risk from air toxics exposure about 5 percent higher than the national average.

**Figure 4. The Number of Nearby Freight Facilities Affects Average Cancer Risk from Air Toxics Exposure**



*Compared with the national average, the risk of developing cancer from air toxics exposure is significantly higher in areas near freight facilities. Average cancer risk from air toxics exposure increases as the concentration of nearby freight facilities grows. For example, populations near a single freight facility experience a cancer risk about 5 percent above the national average. The risk for those near 11 or more facilities is over 30 percent above the national average.*

While proximity is a major driver of exposure to freight-related pollution, it is not the only factor. Weather patterns, topography, and the presence of other pollution sources all affect local and regional air quality—and they all can compound pollution exposure. Even so, the relationship between nearby freight hub concentration and pollution exposure is clear: as the concentration of nearby freight facilities increases, census tracts experience higher levels of DPM and more days exceeding federal standards for both PM<sub>2.5</sub> and ground-level ozone. Concentrations of freight facilities are also a strong predictor of cancer risk from air toxics exposure. All this underscores how cumulative freight activity can shape long-term health outcomes for nearby communities.

# Indirect Source Rules Can Help Address Air Pollution Disparities

The environmental and health burdens of a community result from many factors, and these are not limited to freight activities. The UCS analysis does not quantify how cumulative freight pollution contributes to specific air pollution exposure levels or cancer risk in these communities. Rather, our findings reinforce and add to a broad body of research showing that communities near freight hubs face higher environmental and health burdens. This underscores the need for public policies that target disproportionate air pollution burdens.

ISRs are well-suited for this role: they require facilities to mitigate the pollution that they attract—from trucks, ships, locomotives, on-site cargo handling equipment, and other sources—leading to measurable emissions reductions in freight-adjacent communities. This is particularly the case for communities near high concentrations of freight facilities. Existing ISR programs have already demonstrated their ability to shift facilities toward lower-pollution operations, earning them a place among meaningful policy tools available to state and local governments nationwide (SCAQMD 2026; Mendez and Horowitz 2025).

## What Are Freight-Focused Indirect Source Rules?

A freight-focused ISR requires covered facilities (e.g., warehouses, ports, railyards, and other freight facilities) to reduce the amount of pollution their operations attract. While such facilities are often not major sources of point-source pollution (a factory smokestack, for example), their operations attract highly polluting vehicles like heavy-duty trucks, large container ships, and freight trains. Moreover, on-site mobile cargo handling equipment, such as yard tractors, cranes, and large forklifts, are often significant sources of pollution as well.

With inherently flexible designs, ISRs are well-suited to meet the diverse needs of local economies. A successful freight-focused ISR would deliver measurable, lasting reductions in pollution exposure around freight facilities through flexible and feasible compliance methods tailored to reflect local and regional economic conditions. At the same time, a well-designed ISR could drive broader electrification in the freight system and also improve transparency into the environmental and public health impacts of that system.

ISRs can apply to freight facilities based on various thresholds, such as size, goods throughput, or concentration of locations within a jurisdiction. The state or local agency implementing the policy would not only set facility-specific emissions reduction targets but also provide a menu of compliance options that facilities could use to meet those targets. For example, regulators could create a list of approved pollution reduction actions and assign points to each based on the action's cost and benefits.

A facility could comply with the ISR by accumulating points toward meeting a quota assigned to it based on its emissions profile. For example, a large logistics warehouse may generate hundreds of daily truck trips each day as goods arrive on tractor trucks or delivery vans on last-mile routes to customers. Under an ISR, the warehouse could choose from a menu of options to reduce these associated emissions, such as installing electric vehicle charging

infrastructure at loading docks and parking lots or encouraging visits to their facility by fleets of zero-emission trucks and delivery vans.

Congress explicitly affirmed the authority of state and local governments to adopt ISRs nearly half a century ago through the 1977 amendments to the Clean Air Act (Clean Air Act 1977). Since then, state and regional agencies have adopted ISRs to address pollution from both freight and non-freight sources. To date, freight-focused ISRs have been implemented in a few California regions, and adoption is under consideration or development in several other states, regions, and cities (Gallo 2026).

## How Effective Is an ISR at Reducing Pollution?

ISRs can reduce exposure to pollution in areas adjacent to freight facilities and corridors in two primary ways: by influencing emissions reductions from vehicles, equipment, and other sources and through the pollution mitigation projects that covered facilities can pursue. Research has consistently shown elevated concentrations of key transportation pollutants, such as PM<sub>2.5</sub> and NO<sub>x</sub>, around these freight facilities and corridors (Samuels and Freemark 2022; Yang et al. 2024; Kerr et al. 2024). Reducing pollution near freight facilities could translate into reduced exposure and associated negative health outcomes for the 66.4 million people identified by UCS as living near freight facilities and corridors.

Since 2022, the Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program of the South Coast Air Quality Management District has influenced freight electrification at large warehouses in Southern California. This ISR program has influenced a significant increase in activities designed to reduce facilities' contributions to local air pollution. Between 2021 and 2024, usage of zero-emission yard trucks increased by over 900 percent at covered facilities; visits of zero-emission Class 8 trucks increased nearly six-fold (SCAQMD 2026). The use of lower-emission diesel trucks is responsible for most of the reductions of NO<sub>x</sub> pollution gained from the program, although the share of reductions from zero-emission vehicles and equipment has increased each year. Nearly two-thirds of reductions in diesel particulate matter at covered facilities have been achieved by the use of zero-emission yard tractors (SCAQMD 2026).

Beyond addressing local pollution, ISRs can serve as a foundation for wider-scale freight electrification. By influencing the adoption of less-polluting and zero-emission vehicles and equipment (e.g., battery-electric drayage trucks, delivery vans, and cargo handling equipment), ISRs can contribute to wider demand for and supplies of clean technologies. Similarly, increasing the deployment of battery-electric truck charging and other zero-emission truck fueling stations in and around freight facilities improves the business case for companies to develop regional zero-emission fueling stations. This, in turn, accelerates the adoption of zero-emission trucks.

Between 2021 and 2024, charger usage at facilities covered under the WAIRE ISR increased by over 25 times, from 0.87 gigawatt-hours to 22.96 gigawatt-hours, roughly enough to power about 12 million miles driven by battery-electric tractor trucks (SCAQMD 2026). These actions will help California maintain momentum toward a sustainable, modern, and equitable freight system—even in the absence of federal leadership and investment and amid escalating federal attacks on state clean transportation policies.

ISRs are one of several spatially targeted policy tools at the disposal of state and local governments for addressing air pollution, particularly in and around freight-adjacent communities. However, they are unlikely to address the gap resulting from recently stalled or weakened state and federal vehicle and engine pollution standards (Koolik et al. 2025). The South Coast’s WAIRE ISR has reduced NO<sub>x</sub> emissions by around 1.5 tons per day—only a fraction of regional pollution even if it is a meaningful step in the right direction for the region’s 17 million residents (SCAQMD 2026; SCAQMD n.d.). Combined with other policies and programs—including robust and sustainable incentive programs, clean freight miles standards, and zero-emission delivery zones—ISRs can help reduce public health and environmental burdens, while reclaiming progress toward a modern, sustainable freight system.

### How Does an ISR Affect Freight Facilities?

Facilities covered under ISRs are likely to see meaningful savings from reduced fuel, energy, and maintenance expenditures, even when accounting for increases in upfront costs for investments in clean technologies. For example, battery-electric trucks typically yield the lowest operating costs among available fuel types even though they often come with a significant upfront price premium (Busch et al. 2025). Facilities that install charging infrastructure at loading docks may also see opportunities to generate revenue from non-owned trucks visiting their loading docks.

Even as ISR critics claim the policies can constrain productivity and increase consumer costs, warehouse development and freight throughput have continued to expand in California’s South Coast Air Basin (Mendez and Horowitz 2025; SCAQMD 2026). Because fluctuations in fossil fuel prices affect prices consumers pay for goods, the comparative stability of electricity prices may prove to be a financial benefit for businesses (Diab and Karaki 2023; Chang et al. 2024). Combined with the substantially lower operating costs of battery-electric trucks, this suggests that a zero-emission freight system could help stabilize and potentially lower certain costs for consumers (Ortiz 2023). More research is needed to fully assess this relationship.

# Best Practices for Designing Freight ISR Policies

At the highest level, a successful freight ISR would measurably and lastingly reduce exposure to air pollution in and around hubs. At the same time, it would also influence wider electrification throughout the economy, ensure robust public engagement and participation, and create transparent avenues for understanding the environmental and public health impacts of the freight system. However, this ideal hinges on program designs and how designs influence feasible, flexible, cost-effective compliance over the long term. Several best practices for freight-focused ISR policy designs have emerged as California has implemented regional ISR programs and similar ISR programs have been proposed in other states.

In conjunction with the following four policy design elements, ISRs—like any public policy—should be developed through a robust public process that accounts for the varying needs of residents. The process should include consideration of the cumulative pollution burdens on disproportionately impacted communities and balance potential costs to covered businesses with environmental and public health benefits. Public policies underscored by strong public participation and robust regulatory analytics are key to the feasibility and long-term success of pollution mitigation policies like ISRs (Krutilla and Graham 2023).

## Secure Robust Baseline Data and Program Impact Measurement

As with all public policies, ISRs are evaluated most effectively through accurate, real-world data on the changes they are meant to address. Robust, facility-based measurement and reporting of energy consumption and vehicle and equipment usage are key to creating a baseline for both initial policy design and long-term performance evaluation.

Updated data through periodic reporting requirements can also help decisionmakers understand policy performance and operational changes as the freight system continues to evolve. Accessible digital reporting platforms can reduce both administrative burdens for agencies and compliance burdens for businesses. Implementation of local air quality surveys or long-term modeling projects can help regulators, communities, and businesses alike better understand baseline pollution trends and changes as an ISR is implemented.

## Provide Feasible and Flexible Compliance Options Tied to Measurable Local Benefits

ISR compliance options should deliver meaningful pollution reductions through technically feasible actions aligned with specific local economies. Program structure and compliance point valuation must balance the upfront investments necessary for compliance with the resulting environmental and public health returns.

Compliance actions should yield net reductions in facility emissions, rather than enable a facility to expand its operations: to meaningfully reduce pollution exposure, facilities must reduce their total emissions. Unlike other air pollution policies, ISRs are not well-suited for

credit or point trading markets, which may dilute the local benefits of point-generating actions.

## Permitting and Zoning Should Address Operational and Cumulative Impacts

As proposed freight facilities seek to reduce cumulative and future emissions, permitting and zoning processes that are transparent and accessible can encourage direct participation by and consultation with members of potentially impacted communities. Particularly important are ISR provisions that make it possible to understand and account for impacts on both cumulative pollution and the attainment of air quality standards *before the issuance of a permit to construct or operate a new facility*.

As a further benefit, permitting standards can help reduce pollution exposure for adjacent residences, hospitals, schools, and nursing homes. Such standards would require truck entrances, loading docks, and areas with significant equipment operations to be situated downwind from or as far as possible from sensitive receptors.

## Adapt Implementation Based on Monitoring and Modeling

Local air quality monitoring and modeling are crucial to the overall success of an ISR, both before *and* during program implementation. As the freight system and market for zero-emission technologies evolve, local air quality monitoring can help regulators be strategic about updating ISR regulations to continue providing environmental and public health benefits.

Monitoring can also ensure that compliance remains feasible and flexible. Robust air quality monitoring and detailed local modeling can yield data crucial for improving program design and implementation as well as for evaluating ongoing policy performance—not to mention the role of data in enhancing scientific and public understanding.

# ISR Compliance Options

UCS reviewed a number of compliance options under existing and proposed ISRs as well as other potentially innovative and impactful compliance options. We also evaluated the potential of compliance options to address local and regional emissions, support and accelerate broader freight electrification, and balance upfront and ongoing economic impacts to covered facilities.

Fundamental to ISRs is that implementing agencies provide point-generating compliance options that covered facilities can pursue to meet their assigned pollution reduction quotas. Facilities would choose options that best meet their operational needs and are most economically feasible.

Compliance options generally take the form of actions that reduce the impacts on public health and the environment resulting from a facility's operations. Options may seek to reduce emissions (e.g., by replacing fossil-fueled vehicles and equipment with zero-emission alternatives) or mitigate exposure to pollution (e.g., by installing filters at schools, nursing homes, and hospitals). The structure of compliance points should prioritize emission reductions, address the pollution burdens on nearby populations, and consider the varying life-cycle environmental and public health impacts of zero-emission vehicles, equipment, and fuels.

Additionally, the consideration of economic and feasibility factors helps ensure the long-term success and sustainability of the actions. For example, battery-electric tractor trucks are well-suited for near-term deployments in the last-mile and drayage sectors. They generally have the lowest life-cycle environmental impacts among all fuel types but come with higher upfront costs than analogous diesel models. Given this, points awarded for battery-electric trucks should balance their potential to reduce pollution with the economic inputs required for facilities to deploy the technology.

Toward reducing emissions, well-designed ISRs only credit actions that result in net reductions by replacing existing polluting operations with zero-emission options. Simply expanding operations with cleaner vehicles, equipment, or programs, without reducing emissions, does not adequately address a facility's contribution to local and regional air pollution. Maintaining net pollution by expanding operations with zero-emission vehicles, equipment, and other programs would do little to directly address a facility's contributions to local and regional air pollution. Put simply, zero-emission technologies produce cleaner outcomes when they replace polluting technologies rather than expand overall activity.

## Zero-Emission On-Road Vehicle Visits and Deployments

*Applicable Facilities: Ports, Warehouses, Railyards*



*Source: Sam Wilson/UCS*

### Overview

Facilities that are subject to an ISR and own and operate fleets of commercial vehicles can earn compliance points by acquiring zero-emission vehicles, such as drayage trucks, delivery vans, and cargo bikes. Facilities that do not own fleets can generate compliance points through visits by zero-emission vehicles.

### How Well Does It Address Pollution Exposure?

Reducing and eliminating emissions from heavy-duty vehicles is among the most effective actions for reducing exposure to unhealthy levels of air pollution in areas close to freight facilities. Large ports can host over 10,000 trucks daily, and even a single warehouse can generate hundreds of truck trips each day (Port of LA 2025; Becker 2024). A meaningful amount of freight hub pollution is due to idling emissions as trucks queue outside of ports and during cargo loading and unloading (Port of LA 2025).

Nationwide, medium- and heavy-duty trucks are the largest single source of NO<sub>x</sub> pollution (Wilson 2025). Thus, they bear significant responsibility in regional struggles to maintain healthy air, such as in California's South Coast Air Basin (SQAQMD 2022; Wilson 2025). By directly reducing emissions, electrifying truck trips generated by freight facilities can help address regional air quality issues. Further, electrification can reduce emissions indirectly

through providing a foundation for wider truck electrification throughout the economy and increasing demand for zero-emission medium- and heavy-duty trucks.

### **How Cost-Effective Is It?**

The investment needed for this compliance measure varies significantly. Facilities can encourage clean truck visits through other ISR compliance measures, such as installing infrastructure for zero-emission fueling. While upfront investments to procure zero-emission heavy-duty trucks are high today, the market is moving toward upfront price parity. In particular, the operational costs of battery-electric trucks (e.g., for fuel and maintenance) are often significantly lower than for their diesel counterparts (Busch et al. 2025). As more locations come online for charging and fueling heavy-duty zero-emission trucks, businesses interested in electrifying their fleets may see the upfront capital expenditures drop even further.

## **Installing and Using Zero-Emission Charging and Fueling Infrastructure**

*Applicable Facilities: Ports, Warehouses, Railyards*



*Source: Sam Wilson/UCS*

### **Overview**

Installing zero-emission charging and fueling infrastructure at freight facilities both encourages and enables the operation of zero-emission trucks and equipment at those facilities. Under ISRs, covered facilities can earn compliance points by installing zero-emission charging and fueling infrastructure at loading docks, on-site parking locations, and nearby off-site locations. Freight facilities can also generate compliance points by using on-site zero-emission charging and

fueling infrastructure. Further, such actions can reduce pollution from mobile equipment, such as truck refrigeration units, by enabling them to run on grid power while at loading docks.

### **How Well Does It Address Pollution Exposure?**

A robust zero-emission charging and fueling infrastructure is essential for the current and future deployment of zero-emission vehicle and equipment technologies. By expanding access to zero-emission charging and fueling infrastructure on site and around freight facilities, this ISR compliance measure can accelerate the adoption of zero-emission medium- and heavy-duty vehicles and off-road equipment (e.g., yard tractors, forklifts). The shift to cleaner operations—on and off site—can significantly reduce a facility’s contributions to local pollution, particularly DPM and NOx, and help improve regional air quality as well.

### **How Cost-Effective Is It?**

Costs for installing charging infrastructure vary widely based on the power rating (related to charging speed) of the charging equipment, the on-site electricity infrastructure that supports installation, and the availability of public and private incentives (Xie 2025). On-site charging infrastructure, whether at loading docks or parking locations, can help businesses transition to electric vehicles, reduce operational costs for their fleets, and generate revenue from visiting electric trucks. Freight facilities in states with clean-fuel or low-carbon fuel standards may be able to generate meaningful revenue through the use of charging infrastructure.

## **On-Site Renewable Energy Generation and Battery Storage**

*Applicable Facilities: Ports, Warehouses, Railyards*



*Source: Bilanol/Getty Images*

### **Overview**

Installing on-site battery storage and renewable energy generation can help freight facilities reduce both their environmental impacts and the operational costs associated with electricity consumption. Additionally, on-site storage and renewables may better prepare facilities to connect zero-emission charging infrastructure to the electricity grid in a timely manner. On-site energy resources do this by mitigating the demand that vehicle charging places on the grid, thereby reducing the need for grid upgrades.

Warehouses are often particularly well suited for solar photovoltaic deployments, given that they typically have large, unobstructed roofs. Also, both ports and railyards may have buildings and underutilized land suitable for solar deployments. Large parking lots and vehicle depots may be suitable for solar deployments, generating energy while providing shade for vehicles (Muricy and Stockwell 2023).

### **How Well Does It Address Pollution Exposure?**

Developing on-site renewable energy generation and battery storage helps reduce pollution locally by reducing demand for on-site generators and regionally by reducing demand on the electricity grid. In 2024, facilities subject to the WAIRE Program generated over 106 gigawatt-hours of solar energy (SCAQMD 2026). This is similar to the theoretical amount of energy needed to power 62.5 million miles driven in a modern Class 8 battery-electric tractor truck or around 14 percent of 2024 miles driven by drayage trucks operating out of the ports of Los Angeles and Long Beach (Port of LA 2025; Port of LB 2025; Tesla n.d.).

In addition to facilitating the transition to zero-emission vehicles and equipment, on-site renewables and energy storage may help facilities reduce the use of fossil-fueled, highly polluting backup generators.

### **How Cost-Effective Is It?**

Depending on a system's size, solar generation and battery storage can significantly reduce energy costs for freight facilities, particularly in states with higher electricity costs. On-site generation and storage can provide additional opportunities for electrifying facilities that lower the costs of vehicle charging by allowing for charging on stored electricity at times when the price of grid electricity is higher.

## Acquisition and Use of Zero-Emission Cargo Handling Equipment

*Applicable Facilities: Ports, Warehouses, Railyards*



Source: UCS

### Overview

Cargo handling equipment enables the movement of containers and cargo among ships, railcars, and trucks at freight facilities, transloading goods as they move to their final destinations. Such equipment contributes significantly to local concentrations of unhealthy air quality around freight facilities (Pirhadi et al. 2024). At California’s South Coast ports, cargo handling is the largest source of carbon monoxide from regional port operations and responsible for nearly twice the amount of diesel particulate matter as on-road heavy-duty trucks (Port of LB 2025).

Today, diesel, propane, or natural gas most often power cargo handling equipment, but the availability and deployment of zero-emission equipment have increased significantly in recent years. This is particularly the case for yard tractors and rubber-tire gantry cranes, influenced in part by the enhanced performance and lower operating costs of grid- and battery-electric models (Reback et al. 2024; NACFE 2022).

### Considerations for Wide-Scale Electrification

Measures to electrify cargo handling can help freight facilities prepare for additional zero-emission operations through infrastructure upgrades and by increasing familiarity with zero-emission technologies (NACFE 2022). Zero-emission yard tractors are an excellent first step for electrifying fleets that meaningfully reduce pollution while reducing operational expenditures.

### How Cost-Effective Is It?

Electrifying cargo handling equipment can reduce operating expenditures by lowering fuel and maintenance costs and leading to higher uptimes (NACFE 2022). A recent industry estimate of annual fuel cost savings for a single battery-electric yard tractor came to over

\$36,000 compared with a comparable diesel model, even at electricity costs well above the national industrial average (EIA n.d.; Tanktransport 2025).

## Acquiring and Using Zero-Emission Locomotives and Switchers

*Applicable Facilities: Ports, Warehouses, Railyards*



Source: UCS

### Overview

Rail is the second largest means of transporting cargo, responsible for about 27 percent of freight-ton miles nationwide (BTS 2017). All of the nation's top 25 container ports have either on-dock rail transfer infrastructure or nearby facilities, enabling the transfer of containers from coastal ports to inland ports (BTS n.d.c).

While rail is among the most fuel-efficient means of moving freight and can significantly reduce the need for drayage trucks at importing terminals, locomotives remain a significant source of local and regional fine particulate, NO<sub>x</sub>, and black carbon pollution (Brantley et al. 2019; CARB 2020; Port of LA 2025; Port of LB 2025). Well over half of the locomotives in the United States are over two decades old, subject only to outdated emissions standards. In fact, US rail operations are responsible for more smog-forming NO<sub>x</sub> pollution than coal-fired power plants (BTS 2021; McLaughlin 2025).

Although US freight rail electrification is largely nonexistent, zero-emission freight rail is becoming more common across the globe (Khan and Shao 2024). Over 90 percent of German freight rail operations are electric; India's rail system—both passenger and freight—is over 99 percent electrified (ITA 2024; PIB 2026).

Zero-emission technologies for regional locomotives and switchers are emerging, with promising results to reduce pollution. Despite significant infrastructure and political hurdles

for long-distance electrification in the United States, ISRs are particularly well-suited to helping foster deployments of zero-emission switcher locomotives at freight facilities (Khan and Shao 2024). This can help reduce both localized emissions and fuel costs while expanding demonstrations of zero-emission rail technologies (List, Hoffrichter, and Harris 2023).

## Measures to Mitigate Air Pollution Exposure

*Applicable Facilities: Ports, Warehouses, Railyards*

### Overview

Facilities can earn ISR compliance points through measures that reduce local exposure to existing air pollution in nearby communities even as other ISR compliance mechanisms reduce pollution output. Mitigation measures may include installing air purification systems and high-performing HVAC filters at nearby hospitals, day care centers, schools, retirement homes, and other sites with vulnerable populations. Exposure mitigation projects are best when tailored to the specific burdens of individual communities.

Even though many freight facilities have significantly reduced pollution in recent decades, disproportionate exposure to air pollution persists in many areas adjacent to freight facilities and corridors (Koolik et al. 2024). Projects to mitigate air pollution exposure can help minimize adverse health impacts today as the freight system moves toward cleaner operations.

## Mitigation Fees

*Applicable Facilities: Ports, Warehouses, Railyards*

### Overview

To satisfy their point requirements, facilities subject to ISRs can opt to pay mitigation fees in lieu of taking actions or making investments that reduce emissions and mitigate exposure. Typically, agencies set these fees at levels designed to encourage facilities to pursue other non-fee options to meet their ISR requirements. Mitigation fees under the WAIRE ISR program in Southern California—a total of over \$55 million since the program’s implementation—have represented around 5 percent of compliance points since the program’s implementation (SCAQMD 2026).

Mitigation fees collected under ISRs should be used for projects and programs that improve air quality around laggard facilities. Under the WAIRE ISR program, mitigation fees are generally required to fund pollution reduction projects in the same area of the facility that paid the fee (SCAQMD 2026).

## Emerging and Innovative Compliance Options

While existing ISRs have implemented the above compliance options, agencies creating ISRs can develop other options that may address their specific environmental, public health, and economic circumstances. Several yet-to-be-implemented ideas have potential to reduce emissions meaningfully.

## **Software to Improve Queuing at Ports and Reduce Idling**

*Applicable Facilities: Ports, Railyards*

Major freight facilities can reduce local truck traffic and pollution by adopting and requiring the use of scheduling software that increases the efficiency of drayage truck visits. Drayage trucks often spend significant amounts of time idling in queues, waiting to enter and exit ports. At the Port of New York and New Jersey, average turn times (the total time drayage trucks spend picking up a container or cargo) consistently averaged around 1.5 hours in 2025 (Pier Trucker n.d.). Modeling suggests that advanced machine learning software could significantly reduce drayage turn times. This would reduce harmful pollution from idling trucks, including carbon monoxide and NO<sub>x</sub>, by about 90 percent (Flores et al. 2025).

Today, many large ports utilize software that provides drayage operators with basic terminal information. Expanding such platforms to include advanced scheduling tools could lead to efficiencies that reduce exposure to idling pollution in nearby neighborhoods and lower shippers' fuel and staff expenditures.

## **Measures to Leverage Air Pollution from Wastewater Treatment for Zero-Emission Power at Ports**

*Applicable Facilities: Ports*

Across the country, over 90 active wastewater treatment plants (WWTPs) are located within three kilometers of a major port, including each of the nation's top 10 container terminals (BTS n.d.a; EPA 2026). WWTPs contribute to local air pollution and global climate change through not only direct methane emissions but also harmful pollutants, including NO<sub>x</sub> and carbon monoxide, from methane flaring and combustion for electricity and heat production (ALA 2025; Jackson et al. 2024). Using waste methane in closed-loop fuel-cell systems to generate zero-emission electricity on site, rather than flaring or combusting it, could meaningfully reduce these local pollution impacts (Alcaide et al. 2024).

Waste processing at treatment plants is expected to rise not only with population growth but also with requirements to divert food and yard waste from landfills. For example, California's 2016 Organic Waste Law, SB1383, includes such requirements (CSWRB 2019). As WWTP throughput grows, it will be critical to ensure that additional methane handling does not expand combustion-based pathways but instead prioritizes zero-emission electricity generation that delivers demonstrable net air-quality benefits.

By offering narrowly defined ISR compliance pathways for projects that replace existing methane flaring or combustion, ISRs could help transition treatment plants from pollution sources to localized generators of zero-emission electricity. This would support port operations and freight electrification while reducing strain on nearby electricity grids. A few WWTPs already employ methane-to-electricity systems using technologies such as carbonate fuel cells, and emerging technologies may enable simultaneous wastewater treatment and electricity generation (Alcaide et al. 2024; San Bernardino n.d.).

As with other ISR compliance options, eligibility would depend on demonstrating net reductions in local air pollution relative to existing operations, as well as on measures to ensure that this approach does not incentivize expanded methane production or broader

biomethane subsidy pathways. When carefully bounded in this way, grid-scale fuel-cell electricity generation at WWTPs near ports could reduce localized pollution today, while reserving grid capacity needed to electrify trucks and cargo handling equipment.

Broader implementation of zero-emission electricity production at WWTPs could also help advance pathways for truly zero-emission hydrogen. Today, well over 90 percent of hydrogen is produced from fossil fuels and comes with substantial environmental and public health concerns (Wilson 2023b; Zawawi et al. 2025).

## **Measures to Reduce Commuter Pollution**

### *Applicable Facilities: Ports, Warehouses, Railyards*

Although the main sources of local and regional air pollution from freight facilities are typically the trucks, ships, trains, and large equipment they operate or attract, large freight facilities themselves often employ thousands of people who commute to work each day. ISRs can provide compliance points for facilities implementing programs that reduce commuting. Approaches to reducing pollution and traffic from commuting workers include subsidized transit passes, zero-emission shuttle services, carpool programs, and access to affordable, on-site EV charging stations.

Programs to reduce commuter trips are widespread, with a dedicated industry of transportation management organizations and software providers. While some more tech-focused businesses may pursue their own programs, a regional program shared among covered businesses, and with an accessible platform and strong performance standards, could improve outcomes and reduce costs. Awarding compliance points for commuters based on program performance would help ensure that the intended pollution reductions occur locally.

## **Toward Zero Emissions**

Freight pollution continues to impose serious and inequitable health burdens on the people living and working closest to ports, warehouses, railyards, and major freight corridors. As freight activity grows and freight-hub clustering intensifies, these burdens fall disproportionately on already over-impacted neighborhoods, where the residents face elevated exposure to DPM, NO<sub>x</sub>, and other harmful pollutants. The UCS analysis underscores the ways in which proximity to the freight system matters: the millions of people living near freight facilities are likely to experience increased exposure to harmful air pollution and higher rates of related illnesses.

Indirect source rules offer state and local governments a practical, flexible, and proven tool for helping address these harms. By requiring facilities to mitigate the pollution they attract, and by enabling a menu of feasible compliance strategies, well-designed ISRs can deliver meaningful localized pollution reductions that lessen health impacts even while accelerating broader freight electrification. Together with complementary clean-freight policies, ISRs can help protect freight-impacted communities today and steer the freight system toward a modern, zero-emission future.

# Appendix

UCS designed spatial analysis methods to identify populations exposed to pollution from major components of the US freight system. The following tables rank the most populous US counties based on three metrics: warehouse concentration (# per square mile), warehouse quantity (# per county), and proximity to warehouses. See the methodology at [www.ucs.org/resources/addressing-freight-pollution-source](http://www.ucs.org/resources/addressing-freight-pollution-source) to learn more.

Table A1. Populous Counties, Ranked by Warehouse Concentration

	County Population	Freight-Adjacent Population	Large Warehouses	Large Warehouses per 10,000 Residents	Large Warehouses per Square Mile
Hudson County, NJ	736,185	70.78%	237	3.22	5.13
Dallas County, TX	2,656,028	35.71%	1,953	7.35	2.24
Middlesex County, NJ	890,119	39.39%	539	6.06	1.74
Philadelphia County, PA	1,573,916	45.09%	226	1.44	1.68
DuPage County, IL	937,142	32.42%	494	5.27	1.51
Kings County, NY	2,617,631	38.37%	102	0.39	1.47
DeKalb County, GA	770,307	30.12%	378	4.91	1.41
Union County, NJ	594,160	49.36%	142	2.39	1.38
Clayton County, GA	297,703	22.74%	194	6.52	1.37
Gwinnett County, GA	1,003,869	23.65%	588	5.86	1.36
Tarrant County, TX	2,230,708	30.69%	1,079	4.84	1.25
Queens County, NY	2,316,841	46.65%	119	0.51	1.09
Bronx County, NY	1,384,724	56.01%	46	0.33	1.09
Essex County, NJ	881,527	37.39%	136	1.54	1.08
Denver County, CO	729,019	24.87%	163	2.24	1.06
Cook County, IL	5,182,617	42.31%	1,006	1.94	1.06
Fulton County, GA	1,090,354	30.23%	550	5.04	1.04
Milwaukee County, WI	924,740	42.41%	238	2.57	0.99
San Francisco County, CA	827,526	30.58%	46	0.56	0.99
Franklin County, OH	1,356,303	32.12%	491	3.62	0.92
Jefferson County, KY	793,881	37.07%	347	4.37	0.91
Shelby County, TN	910,530	27.67%	657	7.22	0.87
Cobb County, GA	787,538	24.37%	287	3.64	0.84
Mecklenburg County, NC	1,206,285	24.46%	441	3.66	0.84
Harris County, TX	5,009,302	28.64%	1,376	2.75	0.81
Bergen County, NJ	978,641	29.81%	187	1.91	0.80
Marion County, IN	981,628	37.61%	317	3.23	0.80
St. Louis County, MO	992,929	23.91%	387	3.90	0.76
Cuyahoga County, OH	1,240,594	38.37%	333	2.68	0.73
Davidson County, TN	729,505	35.03%	323	4.43	0.64

Table A2. Populous Counties, Ranked by Number of Large Warehouses

	County Population	Freight-Adjacent Population	Large Warehouses	Large Warehouses per 10,000 Residents	Large Warehouses per Square Mile
Dallas County, TX	2,656,028	35.71%	1,953	7.35	2.24
Los Angeles County, CA	9,757,179	39.30%	1,829	1.87	0.45
Harris County, TX	5,009,302	28.64%	1,376	2.75	0.81
Tarrant County, TX	2,230,708	30.69%	1,079	4.84	1.25
San Bernardino County, CA	2,214,281	30.15%	1,037	4.68	0.05
Cook County, IL	5,182,617	42.31%	1,006	1.94	1.06
Maricopa County, AZ	4,673,096	16.58%	993	2.12	0.11
Shelby County, TN	910,530	27.67%	657	7.22	0.87
Gwinnett County, GA	1,003,869	23.65%	588	5.86	1.36
Miami/Dade County, FL	2,838,461	22.03%	556	1.96	0.29
Fulton County, GA	1,090,354	30.23%	550	5.04	1.04
Middlesex County, NJ	890,119	39.39%	539	6.06	1.74
Clark County, NV	2,398,871	19.00%	495	2.06	0.06
DuPage County, IL	937,142	32.42%	494	5.27	1.51
Franklin County, OH	1,356,303	32.12%	491	3.62	0.92
Riverside County, CA	2,529,933	18.93%	475	1.88	0.07
King County, WA	2,340,211	26.40%	445	1.90	0.21
Mecklenburg County, NC	1,206,285	24.46%	441	3.66	0.84
Will County, IL	708,583	21.72%	438	6.18	0.52
Salt Lake County, UT	1,216,274	19.05%	396	3.26	0.53
St. Louis County, MO	992,929	23.91%	387	3.90	0.76
DeKalb County, GA	770,307	30.12%	378	4.91	1.41
Alameda County, CA	1,649,060	38.07%	372	2.26	0.50
Wayne County, MI	1,771,063	30.98%	372	2.10	0.61
Orange County, CA	3,170,435	30.64%	369	1.16	0.47
Orange County, FL	1,533,646	17.60%	359	2.34	0.40
Jefferson County, KY	793,881	37.07%	347	4.37	0.91
Bexar County, TX	2,127,737	21.64%	347	1.63	0.28
Cuyahoga County, OH	1,240,594	38.37%	333	2.68	0.73
Davidson County, TN	729,505	35.03%	323	4.43	0.64

Table A3. Populous Counties, Ranked by Share of Freight-Adjacent Population

	County Population	Freight-Adjacent Population	Large Warehouses	Large Warehouses per 10,000 Residents	Large Warehouses per Square Mile
Hudson County, NJ	736,185	70.78%	237	3.22	5.13
Bronx County, NY	1,384,724	56.01%	46	0.33	1.09
Orleans Parish, LA	362,701	54.90%	54	1.49	0.32
Passaic County, NJ	526,597	51.89%	100	1.90	0.54
Union County, NJ	594,160	49.36%	142	2.39	1.38
Queens County, NY	2,316,841	46.65%	119	0.51	1.09
Philadelphia County, PA	1,573,916	45.09%	226	1.44	1.68
Milwaukee County, WI	924,740	42.41%	238	2.57	0.99
Cook County, IL	5,182,617	42.31%	1,006	1.94	1.06
Suffolk County, MA	793,144	42.08%	36	0.45	0.62
Multnomah County, OR	795,897	41.05%	250	3.14	0.58
Middlesex County, NJ	890,119	39.39%	539	6.06	1.74
Los Angeles County, CA	9,757,179	39.30%	1,829	1.87	0.45
Cuyahoga County, OH	1,240,594	38.37%	333	2.68	0.73
Kings County, NY	2,617,631	38.37%	102	0.39	1.47
Alameda County, CA	1,649,060	38.07%	372	2.26	0.50
Lucas County, OH	426,291	37.78%	112	2.63	0.33
Marion County, IN	981,628	37.61%	317	3.23	0.80
Essex County, NJ	881,527	37.39%	136	1.54	1.08
Jefferson County, KY	793,881	37.07%	347	4.37	0.91
Dauphin County, PA	293,029	36.58%	76	2.59	0.14
Dallas County, TX	2,656,028	35.71%	1,953	7.35	2.24
Providence County, RI	675,912	35.34%	71	1.05	0.17
Cumberland County, PA	275,516	35.22%	142	5.15	0.26
Davidson County, TN	729,505	35.03%	323	4.43	0.64
Webb County, TX	272,823	35.03%	186	6.82	0.06
Hennepin County, MN	1,273,334	34.87%	277	2.18	0.50
Jefferson Parish, LA	427,253	34.79%	102	2.39	0.34
Ramsey County, MN	542,015	34.78%	89	1.64	0.58
Berks County, PA	439,117	34.77%	112	2.55	0.13

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