

## Asthma and Air Pollution in the San Francisco East Bay

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### Abstract

Primarily low-income, Black, Indigenous, People of Color (BIPOC) neighborhoods face disproportionate exposure to environmental hazards in the United States today. This paper provides a comprehensive overview of environmental racism during the past century. It outlines the historical precedent for policies that perpetuate environmental racism and health inequality while highlighting how they negatively impact health outcomes in the San Francisco Bay Area. Specifically, this analysis explores the ban against non-passenger trucks weighing more than 9,000 lbs on Interstate-580, which traverses the predominantly white, upper-middle-class neighborhood of Oakland Hills in Oakland, California. Consequently, air traffic pollution on Interstate-880, the alternative highway in East Bay that runs through low-income communities of color in West Oakland, bears the burden of air traffic pollution related to trucking. Poor health outcomes, such as the prevalence of asthma and recent wheeze, are elevated in communities near I-880 as compared to I-580. Moreover, greater rates of traffic-related air pollutants, such as black carbon, nitrous oxide, and nitrogen dioxide have been shown to be greater near I-880 than near I-580. This paper explores past successes in the pursuit of environmental justice in California and builds on existing theories to propose potential solutions to the crisis in Oakland.

### Introduction

Although environmental protection in the United States (US) has greatly improved over the past century, many Americans still reside in physically unhealthy environments today. More than 40% of the nation, or a growing 137 million individuals, are estimated to currently live in areas with unhealthy air pollution (Lefohn *et al.*, 2022). The inequitable management and distribution of environmental hazards point toward ethical questions about community health and environmental racism. A form of institutionalized discrimination, environmental racism applies to the disproportionate burden of environmental hazards placed on predominantly low-income, Black, Indigenous, People of Color (BIPOC)

communities and is perpetuated by sociopolitical neglect and residential segregation (Rothstein, 2017).

Modern-day environmental racism can be traced to residential segregation, as social policies following the Great Depression drove communities into greater degrees of division. Under the Roosevelt administration, the New Deal public housing campaign's Public Works Administration (PWA) "segregated projects even when there was no previous pattern of segregation ... by installing whites-only projects in mixed neighborhoods it deemed 'white' and blacks-only projects in those it deemed 'colored'" (Rothstein, 2017, p. 21). This precedent was continued by the US Housing Authority, which explicitly warned against racially homogenous communities. Later in the twentieth century, the Federal Housing Administration (FHA) strategically utilized insured amortized mortgages as a strategy to leave out the BIPOC communities from homeownership nationwide, as the latter were deemed ineligible for such mortgages due to proximity to nearby industrial and commercial areas (Rothstein, 2017).

An early example of environmental justice endeavors is in Warren County, North Carolina, where the predominantly Black and impoverished community fell victim to illegal dumping of the carcinogen polychlorinated biphenyl in the late 1970s. By 1982, when the county was selected to become an official toxic dump site, the National Association for the Advancement of Colored People, commonly known as the NAACP, organized nonviolent street marches for six weeks (McGurty, 2000). While these protests fell short of halting construction at the time, they are broadly recognized for driving the Environmental Protection Agency (EPA) to investigate similar landfills in Southern states. The EPA subsequently reported that all disproportionately burdened minority communities, and this conclusion led to half-hearted attempts to enact legislation that would uphold environmental justice (McGurty, 2000). Policymakers failed to codify environmental justice into law, however, and while awareness since has improved, vulnerable populations still remain at disproportionate exposure to environmental hazards today.

In this paper, we analyze environmental racism by exploring its history, teasing apart health implications, and utilizing the case study of asthma and air pollution in San Francisco's East Bay. We intentionally focus on this region, one widely perceived to lead the nation in progressive and socially encompassing policies, as environmental racism and health disparities could occur elsewhere with similar, if not greater ease (Rothstein, 2017). Today, the Bay Area grapples with a housing affordability crisis that exacerbates institutionalized environmental racism by increasing exposure to pollution and environmental hazards. In the East Bay city of Oakland, homelessness has increased by 24% to 5,055 documented unhoused individuals over the past three years (EveryOne Home, 2022).

Examining Interstate-580's Truck Ban in Oakland, California  
 One policy affecting East Bay residents today is Interstate-580's (I-580) ban on non-passenger trucks that weigh more than 9,000 lbs. While Interstate-880 (I-880) runs closer to neighborhoods in West Oakland's downtown and waterfront—through industrial areas and low-income BIPOC neighborhoods—I-580 traverses regional parks along the base of golden hillsides. As California's only interstate highway inaccessible by trucks, I-580 is predominantly surrounded by upper-middle-class neighborhoods and is consistently less congested than I-880 (Caltrans, 2022).

The City of Oakland originally prohibited the traffic of trucks weighing more than 9,000 pounds, excluding passenger buses and paratransit vehicles, on MacArthur Boulevard—which would later become I-580—in 1951 in order to quell local anxieties over nearby residential values (Caltrans, 2022). Although no data confirmed the link between air traffic pollution and poor lung health at the time, the mid-twentieth century witnessed the shift of upper-middle-class families away from the unpleasant smog and soot of city centers (Miller *et al.*, 1995). Locals believed that given the proximity to the Port of Oakland, the addition of heavy trucking activity would facilitate the growth of industrial centers that would degrade the everyday quality of life in Oakland Hills, making truck traffic incompatible with the idyllic vision of America's dream that pervaded suburbia during the mid-twentieth century. Consequently, Oakland Hills residents promptly mobilized religious groups, educational institutions, and civil organizations to amass support from more than 20,000 signatures in petitioning to expand the existing MacArthur ban to I-580 upon its construction (Schwarzer, 2022). These efforts proved successful, and when I-580 was opened in 1965, the California Department of Transportation, otherwise known as Caltrans, and the Federal Highway Administration upheld the ban. They cited the precedent of trucks being banned on MacArthur Boulevard and furthermore claimed that I-580 was “curvier and hillier” than I-880, making driving large diesel trucks on the former dangerous (Caltrans, 2022). In reality, I-580 was designed to be safe for all vehicular traffic (Klivans, 2021).

The initial ban was only guaranteed to last for three years until 1968. Nonetheless, in 1967, cities neighboring I-580 strove to retain it, this time mobilizing under Grand Lake local John Sutter's “Citizens Against Trucks on the Freeway” and Oakland Mayor John Reading's “Citizens Against Trucks on MacArthur Freeway” movements (Schwarzer, 2022). By arguing that I-580's surroundings were more residential than I-880, encompassing a greater number of schools and hospitals, the initiatives dismissed local community concerns that the prohibition was discriminatory, deflecting to potential extra costs of maintenance should I-580 be opened to non-passenger trucks.

In an attempt to settle the divisive issue, Caltrans initiated studies on several occasions. Conducted in 1967, this was the first study of its kind and suggested that the ban be continued indefinitely on the basis that truck traffic through I-580 would not result in diversion (Klivans, 2021). Despite recommendations for periodic review, advocates of the ban thwarted subsequent initiatives to conduct meaningful research, smothering proposals to study lifting the ban in 1990 and 1999 before they could grow to fruition (Caltrans, 2022). Their immediate resistance to objective research points to their protective stance towards I-580-adjacent communities and disregard for others in the East Bay. Given I-580 neighborhoods’ strong influence in local and state political spheres, Caltrans strategically complicated the matter by necessitating “local agency support; a traffic study to evaluate traffic, safety, noise, and air quality impacts; an environmental document; a public hearing; and also federal approval, because of the 1982 STAA re. truck bans on interstates” in order to consider the ban’s reversal (Caltrans, 2022, p. 1).

Residential proximity to heavily trafficked highways is disproportionately greater in underrepresented communities (Lin *et al.*, 2002). In fact, neighborhoods near I-880 are predominantly composed of Black, Brown, and Latino residents from lower socioeconomic backgrounds, while suburbs near I-580 are mainly upper-middle-class and White (Figure 1) (Alameda, 2016). While health insurance coverage remains above 85% for the I-580 areas of Piedmont, Oakland Hills, and Castro Valley, rates dip below 65% for several inner-city regions of Oakland near I-880 (Figure 2) (Alameda, 2016).

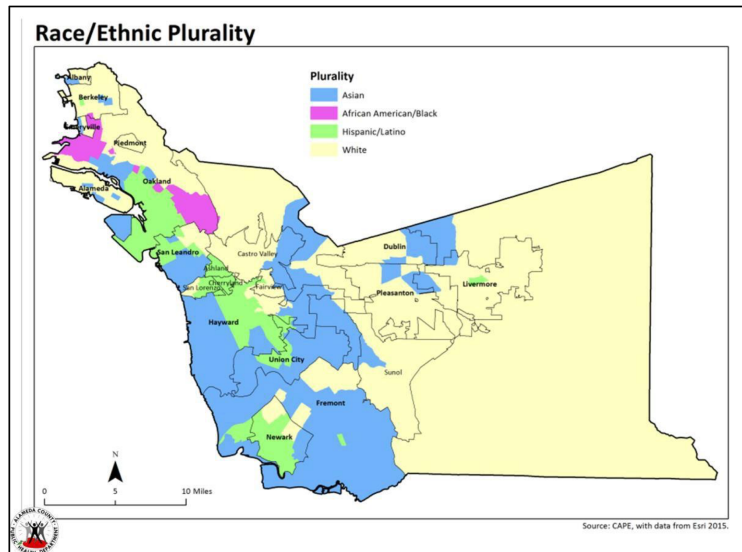


FIGURE 1. Race and ethnicity across Alameda County (Alameda, 2016).

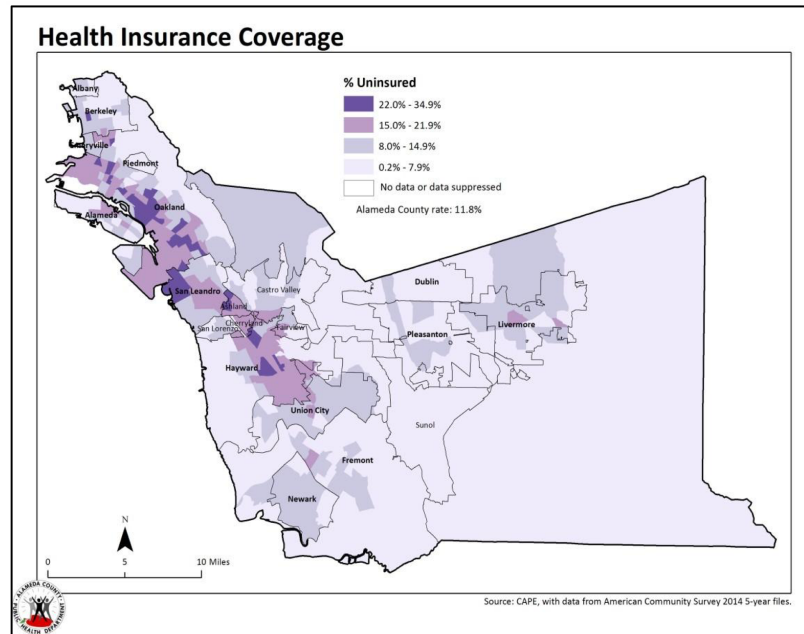


FIGURE 2. Health insurance coverage across Alameda County (Alameda, 2016).

These disparities in healthcare access are exacerbated by the average levels of black carbon along I-880, which are estimated to be approximately 80% greater than those along I-580 (Figure 3) (Caubel *et al.*). Moreover, it has been reported that up to 50% of new pediatric asthma cases in West and Downtown Oakland can be attributed to traffic-related pollution, as compared with 20% of cases in Oakland Hills (Figure 4) (Roy, 2021).

The aggravation of health disparities by environmental racism is staggering. A longitudinal cohort study followed 65,254 children for 10 years and found that the risk of asthma diagnosis during preschool years was statistically increased by traffic pollution emissions of nitric oxide, nitrogen dioxide, and carbon monoxide (Sbihi *et al.*, 2016). Likewise, a three-year analysis of healthy elementary students ( $n=2,497$ ) reported that the risk of asthma development increased with modeled traffic-related pollution exposure in both the school and residential settings. Ambient nitrous dioxide levels at sites central to residential communities were also associated with an increased risk of asthma (McConnell *et al.*, 2006). Other studies have recently underlined how susceptibility to asthma and wheeze is greatest among long-term residents near highly trafficked areas (Lin *et al.*, 2002). Environmental justice is underscored by the ultimate goal of a person's socioeconomic status, race, and ethnicity no longer being indicators of their burden of environmental pollution.

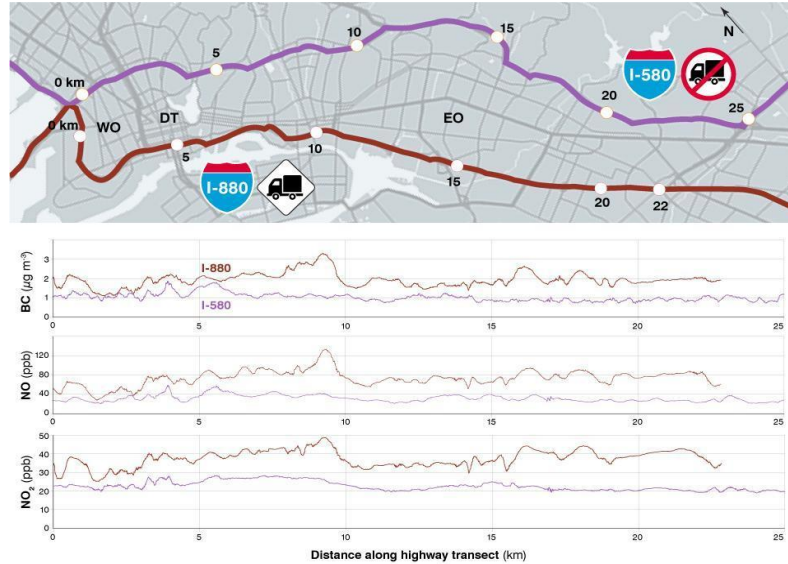


FIGURE 3. Average airborne concentrations of black carbon, nitric oxide (NO), and nitrogen dioxide (NO<sub>2</sub>) measured along I-880 and I-580 (Caubel *et al.*, 2019).

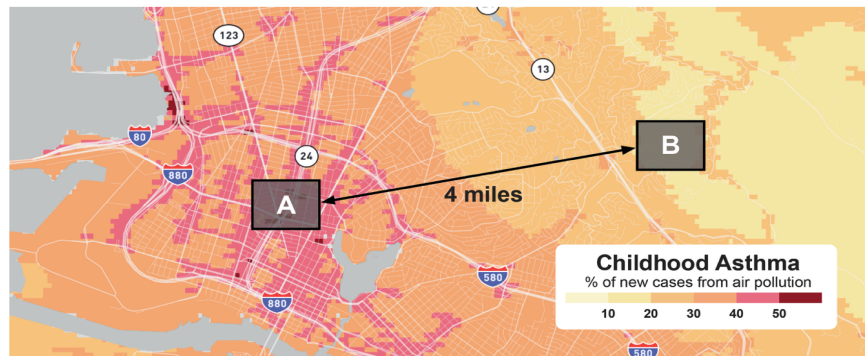


FIGURE 4. Prevalence of new pediatric asthma cases attributed to air pollution (Roy, 2021).

Understanding successful environmental justice interventions Here, we examine strides to protect vulnerable communities from other environmental hazards. By understanding how other movements have succeeded, this paper aims to make meaningful recommendations in the case of asthma and air pollution in East Bay. Over five million individuals in the state of California—92% of which are BIPOC—reside within a mile of an active oil or gas well (Srebotnjak, 2014). In Los Angeles County, almost 600,000 people live within a quarter mile of one of over 6,000 active oil or gas wells, nearly a third of which are located outside sites and among residential areas (Srebotnjak, 2014). Moreover, some idle urban wells, despite being out of operation, have been shown to still emit toxic

gases. Oil and gas wells are known to release hematological carcinogens, like benzene, and have been linked with greater rates of pediatric hematologic cancer, asthma, cardiovascular disease, impaired lung function, and reproductive health issues (Johnston *et al.*, Gonzales *et al.*, Tran *et al.*, McKenzie *et al.*). After years of Angelenos raising awareness for the issue by organizing in formalized institutions like Stand LA—a coalition of environmental justice organizations that supports and works in tandem with groups of other movements, such as Black Lives Matter—lobbying local legislators, and focusing on health implications and economically favorable outcomes, Los Angeles City Council recently unanimously voted to phase out drilling. They banned new initiatives and began analyses to better understand ways to convert jobs in the oil industry into those of clean energy (Canon, 2022).

Later in 2022, Los Angeles County voted to restrict single-use plastic in restaurants and food facilities. Not only are “85% of single-use plastic items in California are not actually recycled, and most recycling facilities in the Los Angeles region do not accept single-use plastic food service ware of any kind because of their size and contamination” (Los Angeles, 2022), but the plastic industry also disproportionately burdens low-income, BIPOC communities, as its production relies on ethane, which is often sourced from fracking (Sicotte, 2020). This ruling, which will go into effect in 2023 and is supported by the coalition Reusable LA, mandates that single-use food ware—including utensils, takeout containers, and cups—must be compostable or recyclable, bans expanded polystyrene, and necessitates reusable containers for full-service, dine-in food facilities (Los Angeles, 2022). Similarly, Reusable LA is a non-profit organization that supported constituent outreach to local representatives, highlighted the alarming health risks related to toxins in single-use plastics, and worked with industry—in this case small businesses—to advocate for and ensure a smooth transition (“The Big One”, 2022).

### Proposing Solutions for Overcoming Asthma and Air Pollution in San Francisco’s East Bay

These common threads support environmental justice theories espoused today. Based on past movements, they report that success is multifaceted and based on organizing formalized institutions, unifying grassroots efforts, emphasizing health impacts of injustices, planning favorable economic outcomes, participating in policymaking processes, and promoting cross-movement activism connecting environmental justice to ongoing movements such as the feminism and Black Lives Matter movements (Schlosberg, 2007; Carmin, 2009). When turning back to the case of asthma and air pollution in the San Francisco East Bay, such approaches can be realized through similar means. This paper recommends five strategies from Schlosberg’s and Carmin’s findings that still apply.

Local non-profit organizations that are working to overcome different aspects of environmental racism in the Bay Area, including asthma and air pollution in the East Bay, should form a regional coalition. From the affordable housing crisis to emissions from oil refineries, the Bay Area grapples with various challenges that all disproportionately burden low-income, BIPOC communities, stem from the same legacy of institutionalized racism, and share overlap in that they would benefit from similar policies protecting vulnerable populations from environmental hazards. By driving awareness and amplifying marginalized voices on a united front, East Bay activists can approach legislators as an all-encompassing group, rather than individually, in order to maximize their reach and impact.

The clean air movement should couple with others—not only in the Bay Area but more broadly—to promote cross-movement activism. Collaboration over projects and similar interests can result in greater solidarity and encourage movements with greater funding to empower lesser-known organizations by co-sponsorships over initiatives at the intersection of issues.

Local governments and nonprofit organizations alike can organize town halls and forums. They would foster civil discourse and serve as informal opportunities local residents to partake in overcoming the challenge that asthma and air pollution pose in East Bay. Not only would they encourage legislators and activists to infuse local perspectives into their everyday work, but they would also provide a feedback mechanism for potential legislation as it is implemented in real-time.

Similar to the campaign to end oil drilling in Los Angeles, the movement to alleviate asthma and air pollution in East Bay can continue to highlight the detrimental effects of traffic congestion on air pollution and human health. By supporting transparent, independent analyses, activists can elucidate the clear link between outdated policies and poor health outcomes in an effort to frame the challenge as objectively as possible. This strategy may also support industry collaboration to provide personal protective equipment, such as air filters and anti-pollution face masks for communities in West Oakland.

The movement can also reach out to professionals and companies in the transportation and trucking industries to devise economically favorable ways to limit traffic-related air pollution in East Bay and abroad. Rather than approach the situation as having one solution—a reversal of the I-580's ban on non-passenger trucks—this paper urges readers to take a step back and acknowledge it as a small part of the larger, underlying issue of traffic-related air pollution in general. Should Caltrans implement a *de jure* reversal on the truck ban, such legislation might fail to translate to a *de facto* reversal unless actors overseeing major trucking companies are incentivized to diverge from traditional plans. If lifting the ban is considered the morally *correct* solution, they should contemplate implementation, without implicitly increasing pollution in other regions of



the East Bay that were previously explicitly protected under I-580's truck ban. Perhaps rather than only lifting the ban, Caltrans should provide economic incentives for zero-emission vehicles for both the industry and consumer sides.

### Conclusion

While the conflict over the East Bay I-580 truck ban remains unresolved at the time of this writing, it has become ever more important given the widespread and intensifying nature of global climate change and represents the greater fight for environmental justice today. By embedding the East Bay case of asthma and air pollution overview in the history of environmental racism within the US, this paper provides a comprehensive understanding of environmental racism as a form of racism and potential solutions to overcome the institutionalized crisis.

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