



WAKE UP AND SMELL THE FUMES

HOW SCHOOL BUS IDLING HARMS
CHILDREN AND COMMUNITIES

NYLPI
JUSTICE THROUGH
COMMUNITY POWER



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ABOUT NYLPI

For more than 45 years, New York Lawyers for the Public Interest has combined the power of law, organizing, and the private bar to fight for civil rights and make lasting change where it's needed most. Our Environmental Justice program fights environmental racism, works to eliminate the unfair burden of environmental hazards borne by low-income communities and communities of color, and seeks to create a more equitable and sustainable city. Our Disability Justice program works to achieve equality of opportunity, self-determination, and independence for people with disabilities.

For more information, please visit us at nylpi.org and on Twitter [@nylpi](https://twitter.com/nylpi).

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EXECUTIVE SUMMARY

Illegal idling of diesel and gasoline school bus engines poses a significant threat to the health and well-being of students, school bus employees and communities that house these school bus depots throughout New York City. Under New York City Law, it is illegal to allow a vehicle's engine to run for more than one minute outside of a school while parked or standing.¹ Despite increased public complaints about idling under New York City's citizen complaint system and recent enforcement actions against school bus companies by the New York State Attorney General, direct observations by New York Lawyers for the Public Interest (NYLPI) found that **20% to 25% of school buses parked outside of schools across the city were idling their engines for more than one minute, in violation of local law.**

This report provides several immediate policy recommendations to improve compliance with idling laws and promote sustainable transportation practices for school buses, including, but not limited to, a rapid investment in zero-emission, all-electric school buses, and adopting driver-friendly policies at schools and bus depots to allow drivers to leave their vehicles during “downtime” while waiting for students.



BACKGROUND AND INTRODUCTION

With about 9,500 buses owned by 41 different private bus contractors transporting 150,000 students daily, New York City's massive school bus fleet has an outsized environmental impact on students and communities.²

First, idling diesel and gasoline combustion engines spew dangerous emissions that harm human health and the environment. Fumes from school buses can be especially dangerous as they transport students, who are still developing and therefore are more susceptible to health effects from the particulate matter and volatile organic compounds found in engine exhaust. These chemicals react in the air to form smog, which exposure can result in numerous health conditions, including cardiovascular and respiratory diseases.³ Exposure to such pollution also directly impacts students' education: for example, the Department of Education reports that asthma is one of the top causes of absenteeism in New York City schools,⁴ and exposure to diesel bus emissions has been found to negatively impact students' academic performance.⁵

Second, school bus mechanics, and other staff working on and near buses, along with exposure to idling emissions can also have significant health implications. Studies have shown that prolonged exposure to diesel exhaust can lead to respiratory issues, such as asthma and bronchitis, as well as an increased risk of heart disease and certain cancers.⁶

Third, emissions from school buses and other combustion engines harm communities. Diesel emissions cause an increase in ground-level ozone which damages plant life, including carbon sinks like trees, and can negatively impact soil and waterways and carbon dioxide from combustion engines is a major contributor to climate change, which disproportionately impacts low-income communities and communities of color where school buses and other pollution sources are concentrated.⁷

*Overall, New York State estimates that \$1.2-\$2.8 billion in health and environmental damages by switching the state's huge fleet of 45,000 diesel and gas-burning buses to zero-emissions electric buses.*⁸

In recognition of these harms, both New York State and City prohibit school buses from idling their engines.⁹ New York City's law is more restrictive, prohibiting any vehicle from idling for more than three minutes, and limiting idling time near schools to one minute with exceptions for emergency vehicles and cold temperatures under 40 degrees Fahrenheit). Additionally, a new City law extends the strict one-minute idling limit to areas surrounding public parks.¹⁰



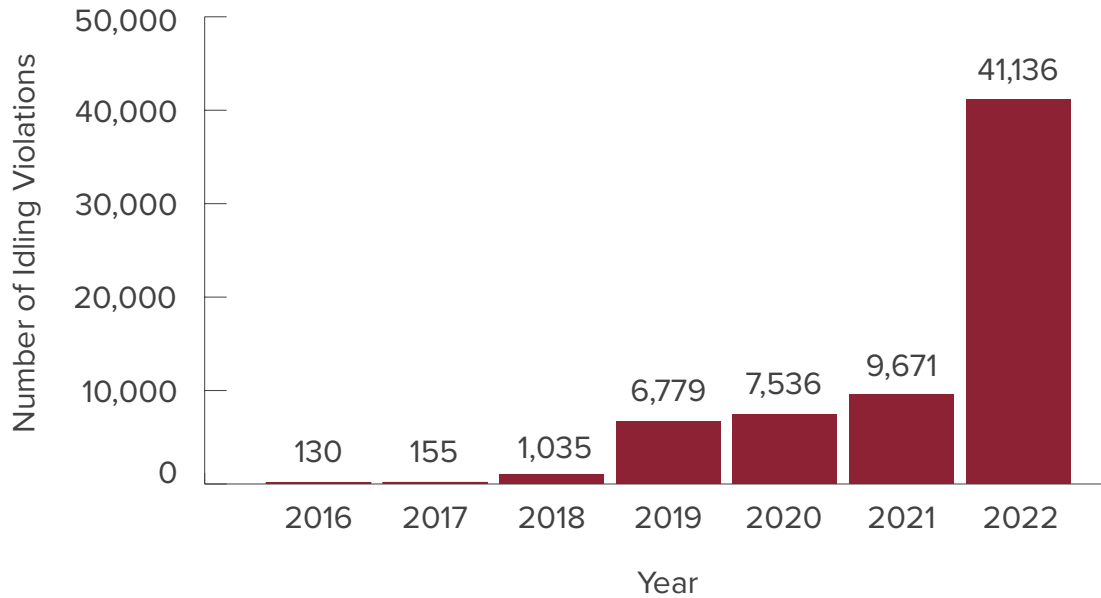
ENFORCEMENT OF IDLING LAWS

Despite increased enforcement of idling laws in recent years, illegal engine idling remains common and widespread.

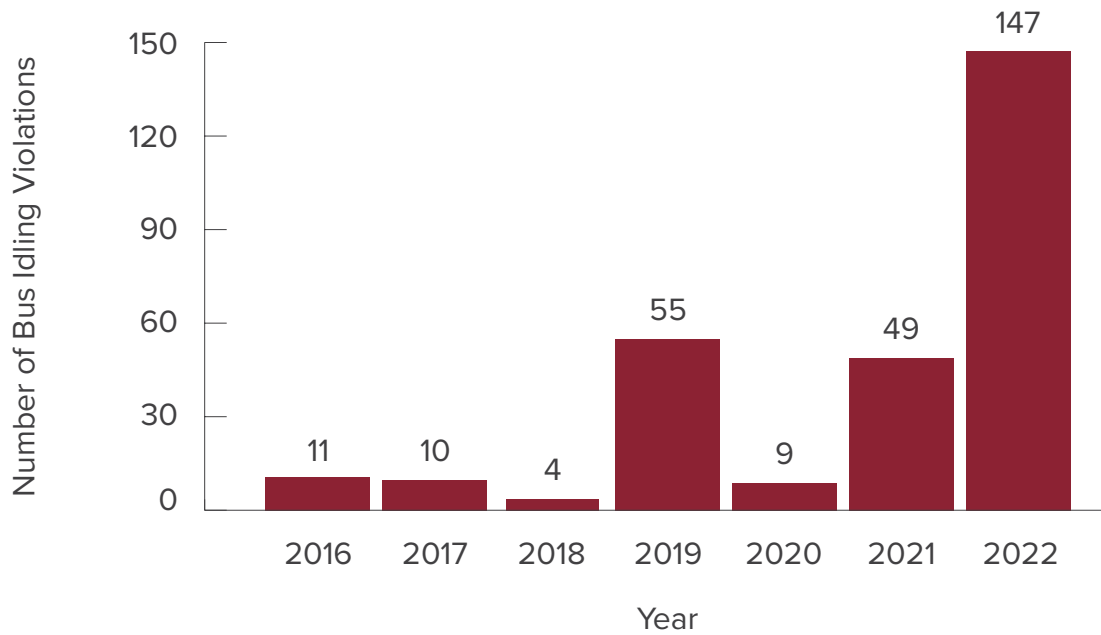
In May 2022, the New York State Attorney General's office brought a complaint against Jofaz Companies, the owner of three school bus companies, for systemic failure to follow idling regulations. The resulting settlement directed the bus companies to ensure that their buses comply with legal limits on idling and mandated education and training employees regarding the health and environmental effects of diesel exhaust and the State and City Idling laws. The settlement also ordered the companies to monitor compliance with idling laws using fleet management technology that records data on vehicles' movement and engine activity.¹¹

City enforcement of idling laws has increased but is uneven. Data from the Office of Trials and Hearings (OATH) show that authorities began to issue citations for illegal vehicle idling in 2021 and 2022, after years of virtually zero enforcement. The number of citations specifically issued to NYC school bus contractors closely mirrors this trend, with a sharp increase in 2022.

Total Number of NYC Idling Violations (Per Year)



Total Number of NYC School Bus Idling Violations (Per Year)

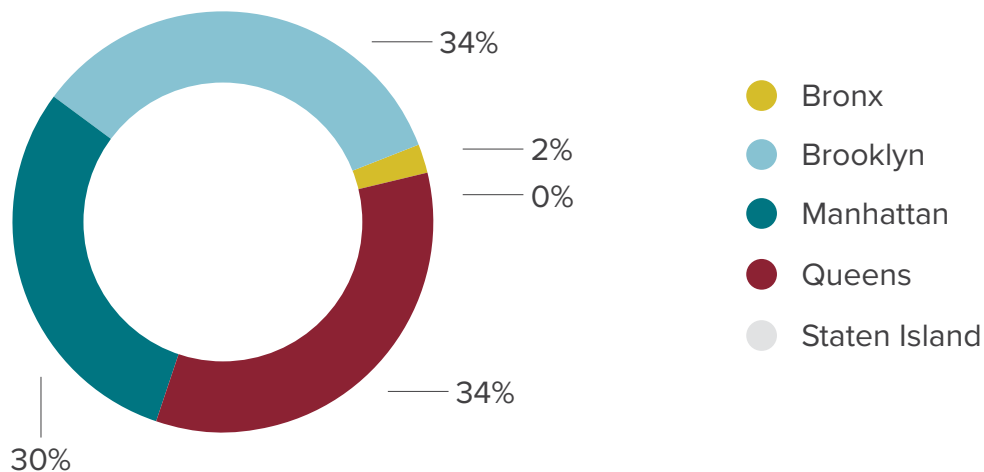


This increase is likely related to the debut of the Citizens Air Complaint System in 2019 which allows ordinary civilians to earn money by reporting documented instances of illegal idling vehicles around the city and has resulted in a 78% increase in the number of air quality complaints filed with the Department of Environmental Protection.¹²

Despite this uptick in enforcement actions, direct observations suggest that current laws and efforts are uneven and inadequate and that illegal idling near schools is still widespread.

Enforcement data also shows significant disparities in the number of idling violations issued across different boroughs. For example, only two percent of the 90,155 violations issued in the past seven years have occurred in the Bronx. In contrast, our direct observations found more instances of illegal school buses idling in the Bronx in just one month than the entire number of violations reported in City data over seven years.

Bus Idling Violations (Per Borough)



Similarly, City data does not include any violations in Staten Island over seven years, although idling has been frequently observed outside of schools in the borough.

These discrepancies suggest that the current Citizens Air Complaint System is unevenly utilized, may be unevenly publicized, and on its own cannot substitute for rigorous City and State enforcement of idling laws.



ILLEGAL IDLING AND ENVIRONMENTAL JUSTICE

Low-income communities and communities of color in New York City are disproportionately impacted by the highly polluting school bus system. Large bus fleets and facilities are clustered in disadvantaged communities (DACs) — along with other fossil-fuel intensive infrastructure and industries — meaning that uneven enforcement of current laws and the City’s ongoing reliance on diesel and gasoline buses disproportionately harm the health of students, residents, and workers in Black and brown environmental justice communities.

The Attorney General’s enforcement action against a large school bus contractor in Red Hook, Brooklyn — is one example of the industry’s impact on a community historically exposed to environmental injustices. Jofaz Companies collectively operates 614 buses and have three bus yards which are all located in nearby environmental justice communities.

In a New York City Law in 2019, all buses that transport public school students must be equipped with Global Positioning Systems (GPS) which took effect in the 2019-2020 school year. The Department of Education (DOE) installed telemetric devices from the Geotab Company that record bus locations based on GPS, along with engine data and idling.

According to the AG’s complaint, this data “showed that Jofaz Companies’ buses idled repeatedly and persistently in excess of New York City’s and New York State’s legal limits,” In addition, and “also repeatedly and persistently idled adjacent to schools, where New York City law limits idling to one minute.” Troubling, the data showed a bus idling for more than ten minutes on 82 different occasions in a period of 42 days at one Red Hook depot, and 30 different school buses also were found idling near a school in the Bedford-Stuyvesant section for at least 10 minutes each, for a total of 285 different times over a period of 65 days.¹³

RED HOOK, BROOKLYN COMMUNITY PROFILE

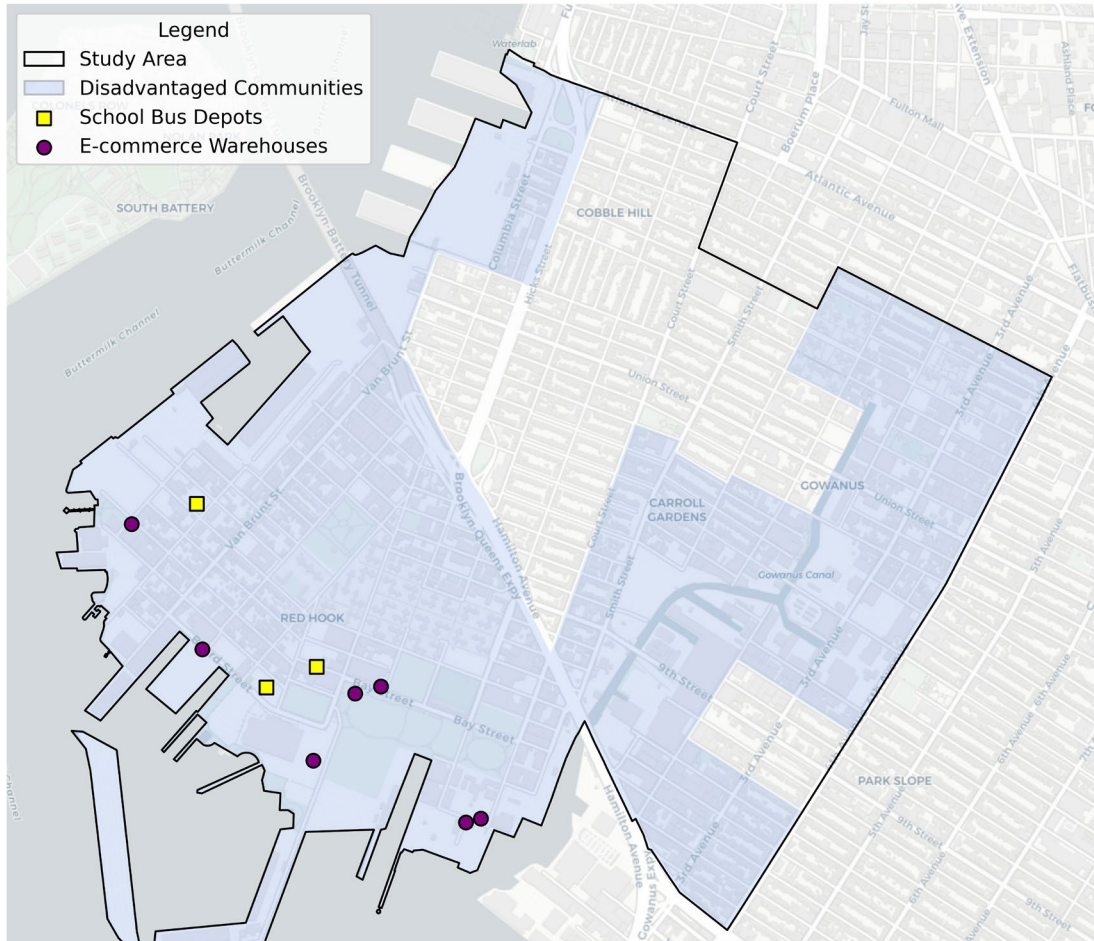
Red Hook is an example of an environmental justice community with a disproportionate concentration of school buses and other pollution sources. It is a mixed-use neighborhood with both light-to-heavy density residential use and manufacturing use. Although Red Hook has experienced gentrification in recent years¹⁴ and is in Brooklyn Community District 6, a now predominantly white district, parts of Red Hook have not experienced the same change as the rest of the neighborhood or the community district.¹⁵

Red Hook is home to the largest public housing development in Brooklyn, where the demographics differ significantly from those of the rest of the community district. The public housing development, Red Hook Houses, located in Kings County Census Tract 85, is comprised of Red Hook East, 16 buildings with 1,411 apartment units, and Red Hook West, 14 buildings with 1,480 apartment units.¹⁶ In total, about 5,900 residents live in this development. 100 percent of the population in this census tract are renters with a median household income of about \$17,649, almost 60 percent of the population identifies as Black or African American, and over 37 percent identify as Hispanic or Latino.¹⁷

As noted earlier, Jofaz Companies operates 614 buses all within a quarter mile of the Red Hook Houses. These three bus depots operate over 400 bus routes. These buses service the neighborhood and other parts of the borough. In addition to the tailpipe emissions from vehicles due to the placement of other transportation infrastructure, such as the Brooklyn-Queens Expressway and last-mile warehouses, this leads to poor quality in Red Hook and similar neighborhoods. In 2018, Brooklyn Community District 6 was recorded as having higher than average borough and city levels of air pollution.¹⁸

Map of Brooklyn Community District 06

Polluting Infrastructure in Carroll Gardens-Columbia Street-Red Hook-Gowanus



PROFILE OF EAST BRONX AND SCHOOL BUS FACILITIES

Bronx Community District 9 is another environmental justice community with a disproportionate concentration of school buses and other pollution sources.

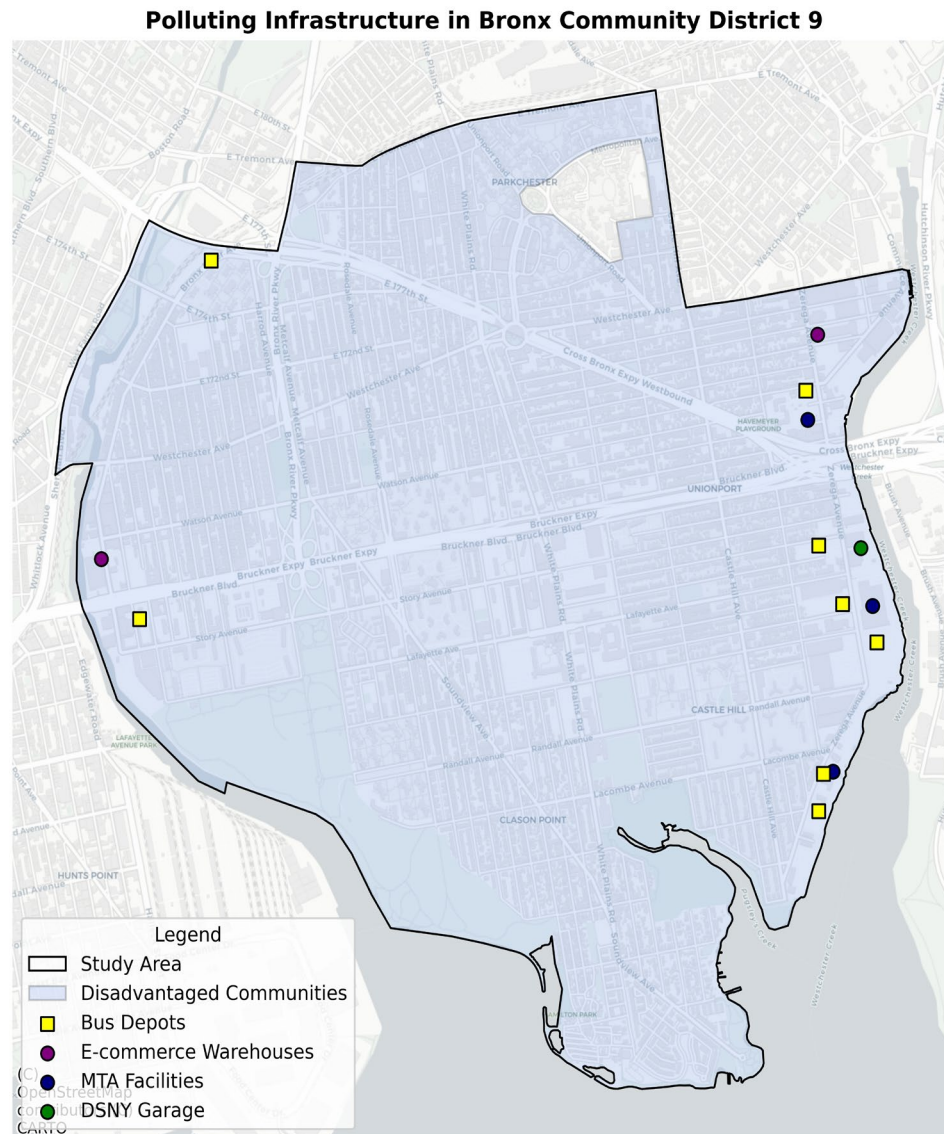
Bronx Community District 9 is home to over 186,000 New Yorkers.

Over 28 percent of residents identify as Black or African American, and almost 58 percent identify as Hispanic or Latinx.¹⁹ The median household income for the district is \$47,043, and almost 30 percent of district residents have incomes below the poverty threshold.²⁰ Over 78 percent of housing units are renter-occupied, with about 49 percent of households being considered rent-burdened.

At least eight school bus depots, operated by seven different companies, are sited in Bronx Community District 9, and two school bus depots are sited along the district's eastern border. These eight school bus depots operate about 989 bus routes.

The asthma emergency department visit rate among children ages 5 to 17 in Bronx Community District 9 is greater than the citywide average.²¹ Similar to Red Hook, this area experiences higher than city-average levels of air pollution due to the placement of the expressways and the school bus depots.

Map of Bronx Community District 09





RESEARCH METHODOLOGY

From May 31 to June 27, 2023, over 19 school days, a team of interns observed 142 total buses across 40 different schools in the Bronx, Manhattan, and Brooklyn. 21 of these schools were in the Bronx, 3 in Brooklyn, and 16 in Manhattan; 4 of the schools were private schools and 36 were public. We conducted follow-up visits to three of the schools to further observe school bus traffic management and idling practices, three of the forty schools were revisited on a separate day and at a different time for further evaluation. Observers recorded location data including school name, location, student arrival and dismissal time of day, and whether each school was in a Disadvantaged Community (DAC) according to the guidelines set forth by New York State Energy Research and Development Authority (NYSERDA).

A total of 142 school buses were observed to be parked near schools. Buses were directly observed idling for over a minute, and the name of each bus's owner. Finally, observers noted any conditions (such as active loading or unloading of students) that might qualify as an exception to New York City's Idling Law. In all observations, the external temperature consistently exceeded the 40° Fahrenheit threshold, rendering the exception stipulated in the New York City Idling Law invalid.

Approximately 1 in 5 of the observed school buses were observed to be idling illegally.²² This appears to be a reduction in idling behavior since 2019, when NYLPI found that 95 of 100 school buses observed near schools were idling.



FACTORS CONTRIBUTING TO IDLING

Our observations also suggest factors that contribute to prolonged engine idling. In many instances, school bus drivers appeared to be idling for no discernable reason; air conditioning and heating were not necessary as external temperatures ranged from 60°F and 76°F.

At several schools, vehicle congestion caused by illegally double-parked cars and street construction appeared to contribute to idling. During peak student drop-off/pick-up periods, school bus drivers appeared to be idling while waiting for a space in traffic to pull into or out of.

In contrast, some schools appeared to have implemented procedures that minimize idling. For instance, at drop-off at P.S. 207 The Godwin Terrace School in the Bronx, all the buses adhered to a specific routine: arriving at their designated time, unloading students, and departing within one minute. Despite the narrow streets and congestion caused by double-parked cars and morning traffic, the buses consistently followed this strategy.

Similarly, P.S. 033 Chelsea Prep in Manhattan designated parking spaces for their buses, ensuring they did not block traffic or idle while waiting to enter traffic. We did not observe any illegal school bus idling at either of these schools.



POLICY RECOMMENDATIONS

New York City and State legislators can take immediate actions to reduce the negative health and climate impacts of the huge school bus fleet, including the impacts of unnecessary engine idling.

1. *New York State and City must ensure that school districts can transition to zero-emissions, all-electric school buses as rapidly as possible, beginning with disadvantaged communities most impacted by pollution and public health problems.* Both the City and State have passed legislation setting the goal of transitioning to an all-electric school bus fleet by 2035, and the state has mandated that all new bus purchases must be zero-emissions starting in 2027. Electric school buses do not emit tailpipe pollution while driving or parked, can be safely parked at bus depots or schools, and bus manufacturers are developing technology that can pre-heat a bus cabin in cold weather without draining the battery.²³

New York's new Electric School Bus Roadmap finds that ESBs currently have a significantly higher upfront cost than diesel buses, and purchasing and installing electric chargers can represent a significant cost and technical challenge for school districts and school bus contractors. While various federal and state subsidies and tax credits are expected to substantially defray the cost of initial ESB purchases for the next few years,

school districts will still face a cost differential of \$24,000 - \$59,000 per bus, and costs of electrical infrastructure may add to substantial increased costs as more electric buses need to be charged.²⁴ Therefore, New York State and City must ensure that additional subsidies and technical assistance are available to electrify as many school buses as possible in disadvantaged communities most overburdened with diesel and gas-burning school bus depots.

2. ***Implement Driver-Friendly School Policies to Reduce Waiting Time in School Buses.*** Schools and the Department of Education should gather direct input from school bus drivers and attendants on how traffic congestion, loading and unloading processes, and time spent waiting inside buses can be minimized at schools and other locations. Schools and the DOE should explore measures like additional designated street space for school buses and changing rules to encourage school bus drivers to wait inside school buildings, especially during inclement weather.
3. ***Target education and outreach to school bus contractors, schools, and communities near bus depots and schools about strategies to eliminate idling.*** The City should combine robust and sustained public and employee education with ramped-up enforcement of idling laws, including education and messaging specifically targeted to school bus contractors, drivers, school employees, parents, and communities near bus depots.

Impacted school bus employees, community members, parents, students, and educators should be involved in both the design and execution of a successful, targeted education campaign. Previous City and State education campaigns (such as the 2020 “Billy Never Idles” campaign interrupted by the COVID pandemic) have been short-lived and may not have been targeted to communities most negatively impacted by idling vehicles.



CONCLUSION

Because school buses are among the most polluting vehicles on the road and because of the huge size of the City’s school bus fleet, measures to reduce and eliminate air pollution from these vehicles can have an outsized impact on the health of children, communities, and the public. Over just a few weeks of observations, at least five buses parked at NYC schools were illegally idling, suggesting that thousands of buses do this on any given school day. This adds to the pollution and health risks that students, workers, and other community members already face from multiple fossil fuel combustion sources.

New York City and State should act now to implement immediate, common-sense solutions to eliminate illegal idling while robustly implementing the transition to a cleaner all-electric school bus fleet with an emphasis on reducing pollution in disadvantaged communities, where poor health is endemic, worsening health problems, degrading the environment, and hindering educational progress.

ACKNOWLEDGMENTS

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ABOUT NEW YORK LAWYERS FOR THE PUBLIC INTEREST

NYLPI pursues equality and justice for all New Yorkers. Our Environmental Justice program fights environmental racism, works to eliminate the unfair burden of environmental hazards borne by low-income communities and communities of color, and seeks to create a more equitable and sustainable city. For more information visit www.nylpi.org.

ABOUT NEW YORK CITY ENVIRONMENTAL JUSTICE ALLIANCE

Founded in 1991, the New York City Environmental Justice Alliance (NYC-EJA) is a non-profit, 501(c)3 citywide membership network linking grassroots organizations from low-income neighborhoods and communities of color in their struggle for environmental justice. For more information visit www.nyc-eja.org.

ABOUT JOBS TO MOVE AMERICA

Jobs to Move America is a strategic policy center that works to transform public spending and corporate behavior with research, policy and community organizing across the county. JMA has led the negotiations of Community Benefits Agreements (CBA's) with EV manufacturers and communities and unions and has worked closely with the Federal and state governments in developing policies to incentivize good jobs and racial equity in clean tech manufacturing. For more information visit www.jobstomoveamerica.org.

TRI-STATE TRANSPORTATION CAMPAIGN

Tri-State Transportation Campaign is a non-profit organization dedicated to promoting sustainable transportation, equitable planning policies and practices, and strong communities in the New York City metro area. For more information visit www.tstc.org.

ENDNOTES

¹ *Idling Regulations*; OFFICIAL WEBSITE OF THE CITY OF NEW YORK; 2023; Available at <https://nyc-business.nyc.gov/nycbusiness/description/idling-regulations#:~:text=The%20New%20York%20City%20Administrative,parking%2C%20standing%2C%20or%20stopping.>

² Amanda Geduld; *How NYC's school bus delays help drive chronic absenteeism and missed learning for students with disabilities*; CHALKBEAT NEW YORK; March 15, 2023; Available at [https://ny.chalkbeat.org/2023/3/15/23630378/nyc-schools-students-with-disabilities-bus-delays-chronic-absenteeism#:~:text=About%20150%2C000%20students%20in%20New%20York%20City%20rely,and%2043%25%20of%20them%20are%20students%20with%20disabilities.](https://ny.chalkbeat.org/2023/3/15/23630378/nyc-schools-students-with-disabilities-bus-delays-chronic-absenteeism#:~:text=About%20150%2C000%20students%20in%20New%20York%20City%20rely,and%2043%25%20of%20them%20are%20students%20with%20disabilities.;); *Bus Companies for School-Age Children*; NYC PUBLIC SCHOOLS; 2023; Available at <https://www.schools.nyc.gov/school-life/transportation/bus-companies-for-school-age-children>

³ *People v. Jofaz Transportation, Inc.* SUPREME COURT OF THE STATE OF NEW YORK COUNTY OF KINGS; May 11, 2022; Available at https://ag.ny.gov/sites/default/files/jofaz_complaint_as_filed.pdf

⁴ *Asthma-Friendly Schools Campaign*; NYC MAYOR'S INTERAGENCY TASK FORCE ON TRUNCY, CHRONIC ABSENTEEISM, AND SCHOOL ENGAGEMENT; November 2022; Available at https://www.nyc.gov/html/truancy/downloads/pdf/asthma_overview.pdf#:~:text=Asthma-related%20school%20absences%20total%20more%20than%20six%20million,and%20our%20high-need%20communities%20are%20the%20hardest%20hit.

⁵ Daniel Kreisman, Garth Heutel, and Wes Austin; *School Bus Emissions, Student Health and Academic Performance*; NATIONAL BUREAU OF ECONOMIC RESEARCH; March 2019; Available at <https://www.nber.org/papers/w25641>

⁶ Andrea Wendt and Matthias Möhner; *A critical review of the relationship between occupational exposure to diesel emissions and lung cancer risk*; CRITICAL REVIEWS IN TOXICOLOGY; February 9, 2017; Available at <https://www.tandfonline.com/doi/pdf/10.1080/10408444.2016.1266598?needAccess=true>

⁷ *Learn About Impacts of Diesel Exhaust and the Diesel Emissions Reduction Act (DERA)*; UNITED STATES ENVIRONMENTAL PROTECTION AGENCY; Last updated May 2023; Available at <https://www.epa.gov/dera/learn-about-impacts-diesel-exhaust-and-diesel-emissions-reduction-act-dera>

⁸ *New York State Electric School Bus Roadmap Final Report*; NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY; p. 3; September 2023; Available at <https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Electric-School-Bus/CNY-EV-schbus-roadmap-bk-1-v1-acc.pdf>

⁹ State law proscribes idling by buses or trucks for more than five minutes when the vehicle is not moving with exceptions for emergency vehicles, vehicles engaged in operations that require the use of the engine (e.g., loading, unloading, or mixing concrete), and vehicles operating in extreme cold weather (defined as an exterior temperature below 25 degrees Fahrenheit) to ensure a safe interior temperature for a vehicle's passengers. See: 6 CRR-NY 217-3.3 NY-CRR; NEW YORK CODES, RULES AND REGULATIONS; Current through December 31, 2021; Available at [https://govt.westlaw.com/nycrr/Document/I4e8f-780fcd1711dda432a117e6e0f345?viewType=FullText&originationContext=document-toc&transitionType=CategoryPageItem&contextData=\(sc.Default\)&bhcp=1](https://govt.westlaw.com/nycrr/Document/I4e8f-780fcd1711dda432a117e6e0f345?viewType=FullText&originationContext=document-toc&transitionType=CategoryPageItem&contextData=(sc.Default)&bhcp=1)

¹⁰ *A Local Law to amend the administrative code of the city of New York, in relation to motor vehicles idling adjacent to and within certain parks*; THE NEW YORK CITY COUNCIL; May 12, 2023; Available at <https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=5755010&GUID=26E2E2E2-97BE-4E5F-945B-D8D5F0B2DD56&Options=ID|TextI&Search=>

¹¹ *People v. Jofaz Transportation, Inc.*; SUPREME COURT OF THE STATE OF NEW YORK COUNTY OF KINGS; May 11, 2022; Available at https://ag.ny.gov/sites/default/files/jofaz_complaint_as_filed.pdf

¹² *Mayor's Management Report*; NYC MAYOR'S OFFICE OF OPERATIONS; p. 312; September 2023; Available at https://www.nyc.gov/assets/operations/downloads/pdf/mmr2023/2023_mmr.pdf

¹³ *Attorney General James Sues Bus Companies for Polluting in New York City Communities*; OFFICE OF THE NEW YORK STATE ATTORNEY GENERAL; May 12, 2022; Available at <https://ag.ny.gov/press-release/2022/attorney-general-james-sues-bus-companies-polluting-new-york-city-communities>

¹⁴ Themis, Chronopoulos; "What's Happened to the People?" *Gentrification and Racial Segregation in Brooklyn*; JOURNAL OF AFRICAN AMERICAN STUDIES 24; p. 549–572; September 5, 2020 Available at <https://link.springer.com/article/10.1007/s12111-020-09499-y>

¹⁵ Poverty Research Unit of the Mayor's Office for Economic Opportunity; *New York City Government Poverty Measure 2019*; p. 15; 2020-2021; Available at https://www.nyc.gov/assets/opportunity/pdf/21_poverty_measure_report.pdf

¹⁶ NYCHA Performance Tracking & Analytics Department; NYCHA 2023 Fact Sheet; p. 3; April 2023; available at <https://www.nyc.gov/assets/nycha/downloads/pdf/NYCHA-Fact-Sheet-2023.pdf>; *Red Hook East*; NYCHA PERFORMANCE TRACKING & ANALYTICS DEPARTMENT; August 2021; Available at <https://www.nyc.gov/assets/nycha/downloads/pdf/Red%20Hook%20East.pdf>; *Red Hook West*; August 2021; Available at <https://www.nyc.gov/assets/nycha/downloads/pdf/Red%20Hook%20West.pdf>

¹⁷ *American Community Survey 2021 5-Year Estimates*; UNITED STATES CENSUS BUREAU; June 15, 2023; Available at <https://www.census.gov/data/developers/data-sets/acs-5year.html>

¹⁸ New York City Department of Health and Mental Hygiene; *Park Slope and Carroll Gardens*; COMMUNITY HEALTH PROFILES; 2018; Available at <https://www.nyc.gov/assets/doh/downloads/pdf/data/2018chp-bk6.pdf>

¹⁹ Poverty Research Unit of the Mayor's Office for Economic Opportunity; *New York City Government Poverty Measure 2019*; p. 15; 2020-2021; Available at https://www.nyc.gov/assets/opportunity/pdf/21_poverty_measure_report.pdf

²⁰ *American Community Survey 2021 5-Year Estimates*; UNITED STATES CENSUS BUREAU; June 15, 2023; Available at <https://www.census.gov/data/developers/data-sets/acs-5year.html>

²¹ New York City Department of Health and Mental Hygiene; *Parkchester and Soundview*; COMMUNITY HEALTH PROFILES; 2018; Available at <https://www.nyc.gov/assets/doh/downloads/pdf/data/2018chp-bx9.pdf>

²² Out of the buses observed, approximately 23.24% or 33 buses were found to be idling for over a minute. Only 6 out of these 33 buses, accounting for a mere 4.23% of the total, were discovered to have valid exceptions as per the New York City Idling Law.

²³ *NYSERDA Electric School Bus Roadmap*; p. 35; Available at <https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Electric-School-Bus/CNY-EV-schbus-roadmap-bk-1-v1-acc.pdf>

²⁴ See *NYERDA Electric School Bus Roadmap*, p. 40.

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