VIA ELECTRONIC MAIL

June 26, 2025

Chair Randolph & Members of the Board
California Air Resources Board
1001 I Street
Sacramento, CA 95814
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Re: CARB must double-down its efforts to reduce harmful pollution from rail.

The loss of CARB's In-Use Locomotive regulation and of the critical emission reductions it is expected to deliver would have devastating public health consequences for communities across California and beyond. Many of us have fought for decades to be able to live without being poisoned by the rail industry. This is why if the Board votes to repeal the In-Use Locomotive regulation, the Board must, in the same breath, commit to do everything within its legal authority to bring rail pollution to zero.

The need to address rail pollution in California has never been greater. Greenhouse gas emissions and criteria air pollutants do not respect state borders. These toxic emissions threaten public health and worsen the climate crisis across the country and beyond. According to EPA's COBRA model, it is estimated that the rail industry is responsible for between 2,200 and 3,100 premature deaths annually, with total health-related costs of $36 to $48 billion.[1] Now is not the time to back down on the state's commitment to protecting our air from the freight rail industry. Electric rail technology is the global gold standard, and building out catenary infrastructure across California will bring good jobs, economic benefits, and help address our deadly public health crisis. It is up to our leading state air agency to work creatively and collaboratively to do everything needed to make zero-emissions rail a reality in California.

> "*[I need] better air quality for my family. Me and my coworkers don't like breathing in the exhaust in the yards."*
>
> *-Lauren Sims, UE 1077*

I. California communities will continue to be harmed under the air pollution status quo if the State cannot achieve the emission reduction goals of the In-Use Locomotive Regulation.

California has long struggled to meet national air quality standards. Five of the ten most polluted cities in the United States—both in terms of short-term and year-round particle pollution—are located in California.[2] Pollution from diesel trains, including particulate matter (PM) and oxides of nitrogen (NOx), has a serious impact on the health of those exposed to it. Those burdens are particularly borne by Californians who are already disadvantaged.[3]

Many of the frontline and fenceline communities living in California's pollution sacrifice zones (and leading the charge to end them) are signatories to this letter. Rail pollution impacts us across dimensions of health, safety, and well-being. Trains passing through our communities are accompanied by bright lights, deafening noises, and vibrations that feel like earthquakes. Trains that are parked or idling routinely require children to jump through dangerous machinery in order to get to school, and emergency vehicles are delayed—exacerbating already life-threatening situations. Rail pollution has serious negative effects on the climate as well. Asthma, cardiovascular disease, and other dangerous illnesses are known to be associated with diesel

[1] EPA Cobra Model, https://cobra.epa.gov/ (as of June 24, 2025).
[2] American Lung Association. State of the Air: Most Polluted Cities (accessed June 3, 2025). https://www.lung.org/research/sota/city-rankings/most-polluted-cities
[3] For example: "Due to their proximity to higher emissions, Black & African American residents [of California] often experience higher-than-average exposure concentrations." Li, Y., Kumar, A., Li, Y., & Kleeman, M. J. (2022). Adoption of low-carbon fuels reduces race/ethnicity disparities in air pollution exposure in California. *Science of The Total Environment*, *834*, 155230.

locomotive pollution and contribute to shorter lifespans. [4, 5] For decades, the rail industry has harmed and poisoned families, workers, and communities with a barrage of pollution from outdated locomotives.

The harms of pollution-as-usual from locomotives are significant and measurable. Research has shown that in California, children living within 10 miles of a railyard have over a 20% increase in the odds of being sent to the emergency room for asthma-related causes compared to children living 20-25 miles from a railyard.[6] This association is not a mere coincidence. US EPA's most recent Integrated Science Assessment for Particulate Matter assigns "causal" or "likely to be causal" relationships between various kinds of PM exposure and respiratory effects, cardiovascular effects, nervous system effects, cancer, and overall premature mortality.[7] These relationships are often even stronger among disadvantaged groups.[8] The harm that pollution creates within an affected community begins before its residents are even born: exposure to pollution during pregnancy is associated with increased risk of preterm birth and low birthweight, especially among disadvantaged communities.[9] This environmental injustice follows community members throughout their lives—with asthma episodes so severe they result in missed school or work days (or even hospitalization); with cancer, heart disease, and other life-changing diagnoses affecting loved ones; and with the psychological consequences of not knowing whether the air in one's community is safe to breathe. We rely on our air regulators to prioritize our health and to work to eliminate industrial pollution. Until then, communities on the frontlines and fencelines of industry will continue to pay, with their health, for the externalized costs of the rail industry.

> *"San Bernardino suffers from the emissions of one of the polluting rail yards in the state of California. As a result of the presence of the yard, many members of the community suffer a number of ailments related to the high amount of diesel emissions, including asthma, COPD, and other similar diseases. Recent track expansion*

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[4] Giulia Grande et al., *Association Between Cardiovascular Disease and Long-term Exposure to Air Pollution with Risk of Dementia*, JAMA Neurol. 77(7), at 801-09, (July 1, 2020), https://pubmed.ncbi.nlm.nih.gov/32227140/.
[5] American Lung Association. 2023 State of the Air, Key Findings (accessed: June 1, 2023). https://www.lung.org/research/sota/key-findings
[6] Spencer-Hwang, R., Pasco-Rubio, M., Soret, S., Ghamsary, M., Sinclair, R., Alhusseini, N., & Montgomery, S. (2019). Association of major California freight railyards with asthma-related pediatric emergency department hospital visits. *Preventive medicine reports*, *13*, 73-79.
[7] U.S. EPA. Supplement to the 2019 Integrated Science Assessment for Particulate Matter (Final Report, 2022). U.S. Environmental Protection Agency, Washington, DC, EPA/635/R-22/028, 2022. https://assessments.epa.gov/isa/document/&deid=354490
[8] *Id*.
[9] Mom and Baby Action Network. (February 2024). Healthy environment for a healthy start: promoting environmental justice for equitable birth outcomes. https://www.marchofdimes.org/sites/default/files/2024-02/MBAN_Environmental_Justice_Report_v7_FINAL.pdf

work has placed even more trains in close proximity to the operations of the yard and truck."

-Marven Norman, Center for Community Action and Environmental Justice

The In-Use Locomotive Regulation was key to California's strategy for mitigating the health risks of air pollution. As CARB's own analysis acknowledged, a transition to ZE technology is necessary because "even if locomotives convert to the cleanest available engine standard level... the diesel engines that power locomotives would still contribute to cancer risk for communities near railyards."[10] The withdrawn regulation would have been responsible for over 30% of the state's overall NOx emission reductions by the 2037 deadline for ambient air quality standards attainment.[11] Now, with such a massive component of the State's strategy expected to be repealed, communities are left wondering how those much-needed goals will be met.

The proposed regulation would have reduced fine particulate emissions by approximately 7,400 tons by 2050 and would have reduced NOx emissions by approximately 386,300 tons in the same time period.[12] In the meantime, the regulation would have stimulated a host of other economic benefits, including through the creation of manufacturing jobs for electric locomotives and infrastructural investment.[13, 14] But instead, as a direct result of withdrawing the In-Use Locomotive Regulation, under the current regulatory status quo California will incur the equivalent of *$32 billion* in additional health-related costs by 2050 due to (otherwise avoidable) morbidity and mortality.[15] Had the regulation been implemented, California would have avoided over three thousand premature cardiopulmonary-related deaths by 2050—nearly two thousand from the South Coast Air Basin alone.[16]

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[10] California Air Resources Board (May 26, 2022). Standardized Regulatory Impact Assessment for Proposed In-Use Locomotive Regulation. https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/locomotive22/appb.pdf

[11] California Air Resources Board (November 7, 2023). In-Use Locomotive Regulation Authorization Support Document. https://www.regulations.gov/document/EPA-HQ-OAR-2023-0574-0053

[12] California Air Resources Board (November 7, 2023). Locomotive Authorization Cover Letter. https://www.regulations.gov/document/EPA-HQ-OAR-2023-0574-0055

[13] See, e.g., Semieniuk, G. and Pollin, R., 2023. Employment Creation through Green Locomotive Manufacturing at Wabtec's Erie, Pennsylvania Facility. PERI Report. UBS Evidence Lab. https://peri.umass.edu/images/PERIGreenLocomotiveStudy.pdf.

[14] UE (September 13, 2024). Rail Crew Drivers and Environmental Justice Organizations Win Passage of Clean Air Rule. https://www.ueunion.org/ue-news/2024/rail-crew-drivers-and-environmental-justice-organizations-win-passage-of-clean-air-rule ("Ultimately, the In-Use Locomotive Regulation aims to begin phasing out diesel trains between 2027 and 2050, creating thousands of manufacturing jobs in the process. The rule will force the railroad industry to put their money into updating their equipment and infrastructure instead of financial schemes and stockholders' pockets.")

[15] California Air Resources Board (November 7, 2023). In-Use Locomotive Regulation Authorization Support Document. https://www.regulations.gov/document/EPA-HQ-OAR-2023-0574-0053

[16] California Air Resources Board (May 26, 2022). Standardized Regulatory Impact Assessment for Proposed In-Use Locomotive Regulation. https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/locomotive22/appb.pdf

These are life-and-death stakes for many Californians. With or without the In-Use Locomotive Regulation, California must identify and commit to a path that ensures we will guarantee a state with safe air for all.

II. CARB needs to do everything within its power to support a statewide electrified rail system for passenger and freight rail.

We urge the Board to double down on its efforts to address rail emissions in the state. The Board should begin by committing to the following principles to support the buildout of an electrified rail system for passenger and freight rail in California. This transition will save companies and agencies money, create quality jobs, improve efficiency, and help people live longer.

1. Commit CARB to doing everything it takes to address the problem of rail pollution.

It is important that the Board clearly state its intention to use its lawful authority to bring rail operating in the state to zero-emissions. This is a time where community and advocates are looking to our leading air agencies to double-down on their commitments to do whatever it takes to protect our health. We are looking to CARB to be creative, open-minded, and strong in this transition.

2. Building an electric rail system is the only path forward for California.

The most cost-effective, efficient, and healthy passenger and freight rail system for California will be electrified by overhead catenary and incorporate discontinuous catenary in key nodes. Battery-electric technology likely makes the most sense for switcher operations. The only rail system that makes sense in the state is one that is electrified. CARB and our other state and local agencies need to commit to this vision so that we can plot out exactly what we need to get there.

3. Center community engagement and public health in every decision going forward.

It is critical that CARB center community members, workers, and public health voices in determining how to proceed in cleaning up locomotive pollution in California. Doing so will put the state in the strongest position to reduce rail emissions and meet our clean air obligations under California's state implementation plan. Meaningful community participation is linguistically inclusive and accommodates working community members' schedules. It is important that the folks who experience the greatest negative impacts from status quo rail operations are included and heard at the beginning of this next process. Transparent and consistent engagement with the community, labor, and public health proponents strengthens policy development and is our best tool to combat the industry's perpetuation of misinformation and myths. CARB must promise to continue consistently collaborating with and being transparent with community, labor, and public health representatives.

"*The Chicago metropolitan area is a transportation hub where approximately 25% of all freight trains and 50 percent of all intermodal trains in the U.S. pass through. Being considered 'North America's Freight Hub' means that we have thousands of locomotives and heavy-duty trucks moving through our communities every single day. This has led to a worsening public health crisis and a growing number of asthma attacks and respiratory diseases as a result of breathing in toxins found in diesel pollution. From Chicago, we demand that CARB commits to deepening its effort to clean up rail pollution and do everything within its authority to protect public health. We recognize that our challenges are interconnected and urge CARB to address rail pollution for the sake of communities across the country."*

-M*elanie Minuche, LVEJO*

4. <u>California needs to build on what is already being electrified.</u>

Rail is already being electrified across California. CARB should be tracking all proposals and developments across the state and do what it can to support rail electrification projects that connect and build on what is already being electrified. This includes looking at which entities own which rights-of-way and facilitating electrification in key corridors keeping in mind emission reduction, environmental justice, and public health considerations. Where there are publicly owned rights-of-way that freight railroads use, it likely makes a lot of sense to support the electrification of these corridors as the benefits can be twofold.

California High-Speed Rail is broadly investing in overhead catenary electrification. There are key corridors or regions where it might make the most sense to electrify gaps between this electrification, especially in densely populated areas that experience immense pollution burdens from the freight industry, like the South Coast Air Basin. Being strategic and thoughtful now will deliver significant benefits down the line.

Similarly, CalTrain electrified a 51-mile corridor between San Francisco and San Jose, replacing 75% of its aging diesel locomotive fleet with zero-emission trains and energized overhead wires. As expected, there were huge air quality improvements as a result of the phaseout of diesel trains

in favor of electric ones, including an 89% reduction in levels of a key carcinogen on board and a dramatic reduction in ambient pollution at the San Francisco station.[17]

Maintaining a bird's eye view of all the rail electrification projects happening across the state and being aware of key areas that are most suitable for electrification is an important role CARB should play going forward, if it isn't already.

> "*Diesel pollution from freight rail impacts frontline and fenceline communities throughout San Bernardino and Riverside Counties due to the many railyards and rail lines that pass through our inland ports. Our counties face some of the highest levels of ozone and PM 2.5 pollution in the country, with high rates of respiratory diseases, including asthma, COPD, and lung cancer. Electrification of California's freight rail lines and railyards would bring immediate and long-lasting improvements to air quality and public health in the Inland Empire, as evidenced by the dramatic reductions in air pollution seen near Caltrain stations in a recent UC Berkeley study. Electrification of freight and passenger rail is the gold-standard worldwide, technically proven, achievable with funding and coordination, and yields direct benefits to intercity transportation, frontline communities, workers, goods movement, air quality, and the environment."*
>
> *-Brianna Egan, Inland Empire Urbanists*

5. Import knowledge from other countries and regions that recently transitioned or are transitioning their rail systems to electric.

While a statewide transition to electric rail can feel daunting, it has been done numerous times before. There are lessons for California to glean from successful shifts to electrified rail across the globe. CARB must make it a priority to learn these lessons and take what works for California so that we can build expertise locally from leaders around the world.

For example, CARB should look to successes in India, which electrified 45% of its rail system in five years and whose rail operators transport goods on double-stacked containers.[18] Italy

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[17] Cliff, Samuel J., *Dramatic Air Quality Improvements after the Complete Electrification of a Commuter Rail System*, Environ. Sci. Tech. Lett. (April 15, 2025), Vol. 12, Issue 5, 587-592 https://pubs.acs.org/doi/10.1021/acs.estlett.4c01096.

[18] Cuenca, Oliver, *Indian Railways launches electric double-stack container operation*, Rail Journal (June 16, 2020) https://www.railjournal.com/freight/indian-railways-launches-electric-double-stack-container-operation/; Ferris,

approached rail modernization as a continuous program rather than one-off projects. This involved continuous, dedicated annual funding that was tied to near-term rail infrastructure plans. This allowed for the buildup of expertise and economies of scale that made projects proceed more quickly and smoothly.

Australia is in the midst of a three-year project capturing braking energy from battery-electric locomotives and returning it to the grid to be used by other trains passing on that line.[19] A French railroad has lowered its own costs by generating renewable solar electricity to be used on its rail lines.[20][4] These are just a few of the lessons that can be learned from other countries that have fully invested in rail electrification or where the railroads themselves have recognized the necessary cost-savings, energy security, and efficiency of operating with electricity.

6. Work creatively with the railroads to secure funding to electrify key freight corridors.

There is a real opportunity to create a situation that works for everyone: California's breathers, the railroads, and our air agencies. Now is the time for us to get creative and work together while not compromising our ideals. Electrification and a zero-emissions future remain the only path forward. It will be key for us to work closely together to determine the best path forward in a way that allows all parties to feel they are gaining something aligned. As part of this, CARB should work with the railroads and the environmental community to secure funding to electrify key freight corridors.

7. Any funding California provides to freight railroads should be for electric locomotives and supporting infrastructure.

State investments must align with the values of protecting public health, cleaning our air, and creating good jobs. While California will likely need to help support this electrification transition, there is no room for handing out money that perpetuates a combustion-fueled future. All funding California provides—across agencies, including via the California Air Resources Board, California Transportation Commission, Air Quality Management Districts, and the California Energy Commission—should go towards electric locomotives and/or supporting infrastructure.

Nick, *How India electrified 45% of its railway network in just five years*, Energy Monitor (Feb. 2, 2024) https://www.energymonitor.ai/tech/electrification/how-india-made-45-of-its-railway-network-electric-in-just-five-years/?cf-view.

[19] Mann, Jasleen, *Australia's ABB captures, stores and regenerates braking energy*, Railway Technology (May 30, 2022) https://www.railway-technology.com/features/australias-abb-captures-stores-and-regenerates-braking-energy/

[20] Beziat, Eric & Fay, Sophie, *French rail service announces plan to generate its own renewable electricity*, Le Monde (July 6, 2023) https://www.lemonde.fr/en/economy/article/2023/07/06/french-rail-service-announces-plan-to-generate-its-own-renewable-electricity_6044351_19.html.

8. Focus on infrastructure.

A significant portion of the transition to electric rail requires building out infrastructure along rail lines. CARB should serve as a connector amongst the relevant agencies, utilities, and railroads to support open dialogues on how this infrastructure can be built out most effectively for the railroads' use in line with the utilities' and public's needs.

III. CARB Must Prioritize Catenary and Battery-Electric Locomotives to Save Lives

Locomotives in the U.S. primarily run on diesel and have remained one of the largest sources of health-harming pollutants in California. Diesel emissions are associated with approximately 70% of the cancer risks that California residents face.[21] In 2022, locomotives in California produced a staggering amount of diesel pollution, including over 640 tons of fine particles and almost 30,000 tons of nitrogen oxides. As a result, the South Coast and San Joaquin Air Basins, regions marked by expansive rail operations and fossil fuel infrastructure, have remained in non-attainment for decades. CARB's In-Use Locomotive Regulation promised both air districts a much-needed pathway to meet federal air quality requirements under the Clean Air Act. Repealing this life-saving regulation should serve as an opportunity to create an even stronger regulation, including safeguards to avoid inappropriate and inefficient solutions such as (1) post-combustion carbon capture systems and (2) hydrogen-fueled locomotives. Modern electric locomotives already run on fully electric motors and have the capability to shift from running on diesel generators to an electric power source that does not emit toxic air pollution. Investing in post-combustion carbon capture and fossil fuel-based hydrogen in the rail context would only delay California's ambitious goals to reverse climate change, gain independence from fossil fuels, and strengthen public health protections. When applied to rail operations, both technologies threaten to deepen reliance on fossil fuels and worsen cumulative impacts in communities living on the frontlines of the ever-expanding goods movement and fossil fuel industry.

First, the majority (95%) of hydrogen created in the United States is produced by steam methane reforming (SMR) of natural gas, and 4% is produced by gasification of coal.[22] Hydrogen production is also water intensive, and difficult to transport because hydrogen can embrittle pipes that were designed for natural gas, is more prone to leaks than natural gas, and is highly flammable with a low auto-ignition temperature and wide flammability range. In addition, hydrogen-fueled locomotives and trains are more expensive to purchase, operate, and maintain

[21] Chernova, Yuliya, *Carbon-Capture Startup Remora Sets Sights on Freight Rail* (April 28, 2025), https://www.wsj.com/articles/carbon-capture-startup-remora-sets-sights-on-freight-rail-3d550192?gaa_at=eafs&gaa_n=ASWzDAiwVCtieEYsC1V8-R7OYA5jM_wJk48SPlTA7JA4PbRZ9c45ixQ6-_j4_YLEZMY%3D&gaa_ts=684cbbda&gaa_sig=YqmHQKnubvMJBWlgCakYBR2BSjnHNbZsrvXcoB_DCYzYJVwygQnBx_2gBJzfcXGVLjroh0Zekyr5wWhN3Fl-rw%3D%3D.

[22] Hydrogen Production: Overview and Issues for Congress (2025), https://www.congress.gov/crs-product/R48196.

than conventional all-electric locomotives powered by overhead catenary wires.[23] While most all-electric trains draw on energy from an external source via overhead catenary wires as needed—hydrogen trains must transport the weight of their fuel and rely on external fueling infrastructures to operate.[24]

Hydrogen fuel-cell electric trains are zero emissions at the point of use and are beginning to be adopted by certain train operators. However, unless hydrogen is produced by electrolysis using renewable electricity, there will still be climate emissions and pollution from hydrogen production. In addition, even for hydrogen produced using renewable electricity, the total efficiency of a hydrogen fuel-cell locomotive is approximately 3x less than a directly electrified catenary locomotive – and so would require a buildout of 3x more renewable energy.[25]

Second, post-combustion carbon capture systems only target carbon dioxide and do not address diesel PM or black carbon responsible for shortening life expectancy in communities breathing toxic rail emissions. Installing this technology on locomotive lines would require adding an entirely new component "loaded onto a separate tender car that would sit between the locomotive and the rest of the train."[26] Such systems have rarely been used outside of stationary industrial settings. With a shrinking state budget and limited resources for oversight and enforcement, CARB must prioritize investments in proven technologies to accelerate the transition to zero-emission rail operations.

Catenary and battery-electric locomotives will enhance train speed frequency due to better acceleration and improved train reliability, while reducing operation and maintenance costs. Prioritizing state funding for zero-emission electric locomotives, vehicles, equipment, and infrastructure is necessary to ensure a long-term reduction of air pollution. The technology to electrify rail operations has already achieved significant emission reductions around the globe. This life-saving technology is more than one hundred years old—with modest maintenance and fuel costs compared to diesel engines. Electric locomotives and trains can also use power generated from a wide mix of sources, including renewables. They have greater power per unit, with one electric freight locomotive able to replace the operating capacity of two diesel engines.[27] We urge CARB to prioritize electric locomotives to safeguard community health and safety.

> *"Los más vulnerables continúan pagando con su salud y su vida, mientras la inacción de quienes tienen el poder perpetúa esta crisis. Necesitamos soluciones urgentes y decisiones valientes que*

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[23] Sierra Club, Rail Transportation Statement (Aug. 2023), at 13, https://www.sierraclub.org/sites/default/files/2023-08/Rail%20Report%20FINAL.pdf.
[24] *Id.* at 8.
[25] Rail Report FINAL.pdf at 11; See also RIA *Why Electrification report*, https://riagb.org.uk/RIA/Newsroom/Publications%20Folder/Why_Rail_Electrification_Report.aspx.
26 WSJ article, Carbon-Capture Startup Remora Sets Sights on Freight Rail - WSJ (Apr. 28, 2025).
[27] See Sierra Club Locomotive report, Rail Report FINAL.pdf. See Sierra Club, Rail Transportation Statement, at 11.

prioricen la justicia ambiental y el derecho a un aire limpio para todos."

"The most vulnerable continue to pay with their health and lives, while the inaction of those in power perpetuates this crisis. We need urgent solutions and courageous decisions that prioritize environmental justice and the right to clean air for all."

-Benjamin Luna, Resident of San Bernardino

Regulators and decision-makers must prioritize community inclusion and address the urgent climate and public health crises caused by the rail industry that disproportionately harms frontline residents in California but also reduces life expectancy for people living throughout the U.S. Now is the time for CARB to double-down on its commitment to protecting our air and communities by taking clear, lawful action to electrify all rail operating in California.

Sincerely,

Marven Norman
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Center for Community and Environmental Justice

Natalia Ospina
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Center on Race, Poverty, & the Environment

Gustavo Aguirre Jr.
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