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Driving on Fumes: Truck Drivers Face Elevated Health Risks From Diesel Pollution

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Diesel pollution is well known to be hazardous to human health. Groups at particular risk include workers in diesel industries, such as trucking and rail, and communities located near major sources of diesel pollution, such as ports and freeways. Truck drivers who serve ports are at especially high risk: Potential exposure to pollution from their own diesel trucks is combined with elevated levels of background pollution generated by other port trucks, cargo-handling equipment, ships, and locomotives. A recent investigation by NRDC and the Coalition for Clean and Safe Ports analyzing the air quality inside truck cabs revealed alarmingly high levels of pollution—and serious health threats. These findings make clear that we must act quickly to implement programs already under development that could offer substantial relief from the staggering diesel pollution at California's ports.

Driving on Fumes: Truck Drivers Face Elevated Health Risks From Diesel Pollution

Diesel Pollution is Deadly

Diesel engines emit a toxic brew of particulate matter (PM), smog-forming nitrogen oxides (NO_x), and volatile organic compounds. Diesel exhaust is estimated to be responsible for 70 percent of the total cancer risk from air pollution.¹ Occupational exposure of truck drivers, railroad workers, heavy-equipment operators, and other workers is associated with lung cancer risks 40 percent higher, on average, than in the population at large.²

Numerous studies have documented a wide range of other adverse health impacts from long-term exposure to diesel PM. These include increased risk for cardiovascular disease such as atherosclerosis, increased heart attacks, increased emergency room visits for acute health events, birth defects, low birth weights, premature births, and increased rates of death. According to a recent California Air Resources Board (CARB) report, trucks involved in goods movement were responsible for more than half of the estimated 2,400 premature deaths attributable to diesel exhaust from California freight transport in 2005.³

“At the end of my shift, when I get home, I wash my face. It takes a few cotton swabs, and they are covered in black when I am done.”

Gina, a truck driver at the Port of Oakland

Pollution is Concentrated Inside Truck Cabs

NRDC monitored the air inside the cabs of seven trucks for black carbon, an indicator for diesel PM, during an entire work shift serving the Port of Oakland for a total of 68 hours of sampling time. We found that all of the average black carbon levels measured within the truck cabs were at least 10 times higher than the background level of 0.3 µg/m³ found in a working class Oakland neighborhood; samples from inside a 1981 model year truck showed levels of black carbon roughly *25 times* higher than the background level (see Figure 1).

The estimated levels of diesel soot in the truck cabs based upon black carbon measurements also varied depending on location (see Figure 2), with port and freeway locations having nearly twice the diesel soot concentrations as local roadways.⁴ These soot levels are significantly higher than those previously found along truck corridors near the Port of Oakland and at Port of Oakland terminals, suggesting that diesel PM may be accumulating inside truck cabs.

Our investigation indicated that the air in newer trucks tends to be slightly cleaner than the air in the oldest trucks, implying that some portion of the diesel PM that the drivers inhale comes from their own trucks. However, the diesel

Figure 1: Average Black Carbon Levels (An Indicator of Diesel PM) Measured Inside Trucks Serving the Port of Oakland

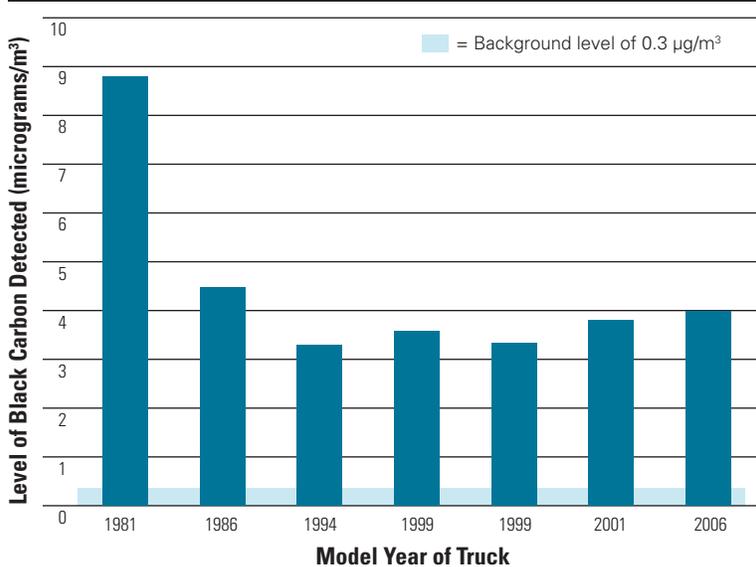
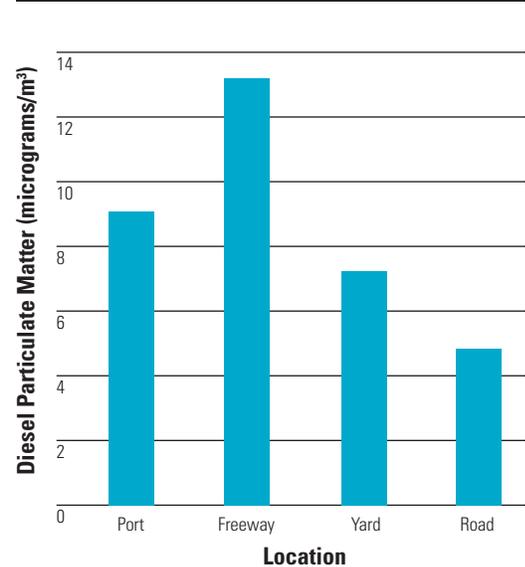


Figure 2: Average Diesel PM Levels Measured Inside Trucks at Various Locations





PM levels found inside the cabs of newer, cleaner trucks remained elevated across model years, but showed greater variation depending on the location, leading us to conclude that most of the exposure was from surrounding diesel sources in the port environment.

Truck Drivers Face Off-the-Charts Health Risks

The amount of diesel PM that we estimated inside the truck cabs was enough to increase health risks by up to 2,600 excess cancers per million drivers—double the level considered acceptable by the Occupational Safety and Health Administration (OSHA), and up to 2,000 times greater than the level typically considered acceptable by state and federal environmental protection agencies.^{4,5} By comparison, the background health risk from diesel PM in urban areas is 500 to 800 potential cancers per million people.⁶ This risk roughly doubles in areas with major sources of diesel pollution.⁷ Because port truck drivers often live near work, their exposure to diesel exhaust at work is likely compounded by additional exposure at home in communities polluted by emissions from shipping.

Widespread Changes to Reduce Diesel Pollution Are Needed

The most striking finding of this work is that all of the truck drivers that participated are exposed to unhealthy levels of diesel PM—regardless of how new or clean their trucks are. This finding suggests that in order to reduce drivers' health risk, it is likely necessary to clean up the entire port truck fleet, reduce wait times at the terminals, and reduce pollution levels from other port sources. While this investigation focused on trucks serving the Port of Oakland, we expect similarly severe conditions affecting truck drivers serving the Ports of Los Angeles and Long Beach, and other large container ports. Further study is necessary to assess the finer details of exposure based on location and individual truck characteristics.

The major health impacts occurring within the port trucking industry highlighted here should be taken as a call for immediate action to mitigate port pollution. Not only does the port truck fleet need to be cleaned up as quickly as possible, but it is clear that improvements are needed on a fleetwide, statewide basis in order to reduce the levels of diesel soot to which truck drivers are exposed. All major sources of freight transport pollution—ships, locomotives, cargo equipment, and trucks—should be addressed simultaneously.

Recommendations for Reducing Pollution Affecting Port Truck Drivers

The following recommendations provide a roadmap for reducing diesel pollution and minimizing the health threats to truck drivers working at and near California's ports.

PORTS AND RAIL YARDS

- The Ports of Los Angeles, Long Beach, and Oakland should use their authorities as landlords to implement concession agreements (contracts that set environmental, community, and labor standards) for all port trucking companies in order to achieve a quick and sustainable clean up of the port truck fleet. In addition to requiring clean trucks, it is important that these concession agreements require the use of employee truck drivers in order to shift the maintenance responsibilities to the trucking companies.
- Ports should ensure that all existing air quality planning goals are met on time and should impose green standards on all tenants.
- Ports should detail enough full-time staff members to properly enforce regulations, including idling restrictions both on-port and at the gates.
- Rail yards should commit to phasing out all locomotives that cannot achieve 90 percent reductions in particulate matter from current standards (U.S. EPA Tier 2). They should also begin to electrify infrastructure; institute clean truck programs; ensure that all vehicle, equipment, and locomotive replacements are the cleanest, most efficient models available; and utilize operational efficiency measures to reduce pollution.

A Day With a Truck Driver

My name is Mohammed Asif, and I have been driving at the Port of Oakland for five years. The port truck drivers get no respect inside the port. I usually work 10 hours a day moving containers from one terminal to another. In order to make a decent living I try to make four trips a day. But usually I can only make three, because many times I have to wait up to two hours to pick up a container at the terminal.

While we wait in these lines our trucks are polluting the air and getting ourselves and the community sick from this pollution. I know that my truck pollutes the air, but there is nothing that I can do about it because as an independent port truck driver I cannot afford a new one.

I don't have health insurance. Fortunately, my wife has insurance for herself and our child. I am lucky that I don't currently have any medical problems, but many of my fellow drivers have breathing problems and back pain. I want to work hard, provide a good life for my family, and not pollute the air that we all breathe. But the trucking system at the port is so broken that it isn't possible.

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CARB Clean Up

Two separate regulations are currently under development by CARB to substantially cut pollution from trucks. The "Port Truck" regulation will clean up trucks that serve major ports and rail yards in the state. Approximately 18,000 heavy-duty trucks will need to be retrofitted, replaced or otherwise upgraded by 2009. A second proposal covers all heavy-duty trucks, requiring further clean up in 2014 and beyond.

REGULATORS

- EPA should expedite implementation of new emission standards for locomotives and marine vessels.
- The California Air Resources Board should move forward quickly with its Goods Movement Emission Reduction Plan, including rules requiring clean trucks, shore-side power, and cleaner marine fuels, among other measures.

POLICYMAKERS

- Governor Schwarzenegger should work with the California legislature to implement container fees for major ports in California in order to help fund the replacement of polluting equipment.
- Policymakers should ensure that a portion of Proposition 1B infrastructure bond funding goes to alternative forms of freight transportation that reduce pollution and fossil fuel use, such as electrified rail projects.

DRIVERS, OWNERS, AND FLEET MANAGERS

- Regular maintenance to keep trucks in good working condition should be performed.
- Vehicles should be checked daily to make sure they are not smoking or burning excessive amounts of fuel or oil. Upon recognition of any of these problems, the vehicle should immediately be taken out of service for maintenance.
- Idling limits set by the state should be followed and idling should be minimized in order to save fuel, reduce pollution, and limit exposure to unhealthy exhaust.
- Funding available to help offset the cost of purchasing cleaner replacement trucks or exhaust controls for older trucks should be aggressively pursued.

A New Approach to Socially Responsible Trucking

The Clean Trucks Program, proposed by the Ports of Los Angeles and Long Beach, plans to replace or retrofit 16,000 harbor trucks in five years, limit terminal access with tariffs, and allow only "clean" trucks into terminals. The Clean Trucks Program seeks to create concession agreements between the ports and trucking companies through which the ports can set uniform environmental standards. The ports would require trucks serving their terminals to meet 2007 emission standards, with a progressive ban on old trucks phasing in between 2008 and 2012. Trucks not meeting the standards would be subject to a Truck Impact Fee. The Port of Oakland is contemplating proposing a similar program.

The Coalition for Clean & Safe Ports is a coalition of environmental, community, and labor organizations working to promote sustainable trade through California's largest ports. The Coalition supports the ports' efforts to implement a concession model for port trucking. The concession model will allow the ports to set environmental, community, and labor standards for trucking companies operating at the ports. Setting uniform standards that all companies must follow will promote investment in clean trucks, result in a sustainable reduction of pollution, and increase the efficiency of port operations. Requiring employee drivers through the concession model will shift the responsibility of maintaining new trucks to the trucking companies and allow drivers the protection of health and safety laws. Currently, independent contractor drivers do not have OSHA protections on the job, whereas employee drivers do.

1 California Air Resources Board, *Diesel Risk Reduction Plan*, October 2000.

2 Office of Environmental Health Hazard Assessment (OEHA), Part B: Health Risk Assessment for Diesel Exhaust, 1998.

3 California Air Resources Board, "Quantification of the Health Impacts and Economic Valuation of Air Pollution From Ports and Goods Movement in California," Appendix A in Emission Reduction Plan for Ports and Goods Movement (GEMERP), March 22, 2006, http://www.arb.ca.gov/planning/gmerp/march21plan/appendix_a.pdf.

4 Black carbon measurements were converted to diesel PM concentrations assuming DPM = 2.67 * BC based on the following source: Fruin, S.A., et al., "Black Carbon Concentrations in California Vehicles and Estimation of In-Vehicle Diesel Exhaust Particulate Matter Exposures," *Atmospheric Environment* 38 (2004), pp. 4123-4133.

5 Regulators generally presume that a one-in-one million risk of cancer from life-long exposure to a hazardous chemical is an "acceptable risk" according to OEHA guidance at <http://www.oehha.ca.gov/pdf/HRSguide2001.pdf>.

6 Cancer risks associated with diesel PM were calculated per OEHA methodology: Cal EPA, Office of Environmental Health Hazard Assessment, Air Toxics Hot Spots Program Risk Assessment Guidelines, August 2003, http://www.oehha.ca.gov/air/hot_spots/pdf/HRAguidefinal.pdf.

7 CARB, 2006, p. A-57.

8 Ibid.