Diesel Pollution and Health Impacts on School Children

Multnomah County
Office of Sustainability

Diesel exhaust is bad for everyone's health:

Exposure to diesel engine exhaust causes cancer; increases the risk of heart attack, stroke, and cardiovascular disease, exacerbates asthma and can lead to low-weight and preterm births[1]. Multnomah County has the 4th highest concentration of diesel exhaust of all United States' counties.

Although there are no areas of Multnomah County with safe levels of diesel pollution, the pollution "hot-spots" are in neighbor-hoods with higher proportions of residents who are people of color. The disproportionate exposure to diesel mirrors health disparities in the community, particularly asthma, cardiovascular disease and low birth-weights[2].

Health effects of diesel exhaust

Diesel exhaust contains tiny sooty particles and more than 40 hazardous pollutants which can be inhaled deep into the lungs and absorbed into the blood stream. Children, and workers exposed to diesel at close range, are at highest risk of harm. Known and suspected health effects include:

- Cognitive impairment
- Heart attack
- Asthma attacks and more severe symptoms
- Male infertility
- Impaired lung growth in children
- Autism linked to maternal exposure
- Higher risk of stroke
- Exposure can worsen allergies
- Lung cancer
- Birth anomalies linked to maternal exposure

Diesel in Oregon causes as many as **468 premature deaths** and **$3.5 billion** in economic loss each year.

School kids are particularly at risk from diesel exhaust:

Children are especially vulnerable to air pollution because their lungs are still in the developmental phase and they breathe, on average, 50 percent more air per pound of body weight than adults.

School children who ride on older diesel school buses that lack pollution controls have a 4% increased likelihood of developing cancer due to diesel particulate matter in their lifetime.[3] In addition, exposure to diesel exhaust enhances allergic response, can induce new allergies to airborne allergens, and exacerbate asthma.[4] Studies have also shown that diesel exhaust gets caught in the school bus cabin, increasing children's exposure.[5] Although bus commutes only comprise a fraction of a child's day, the bus ride can represent up to 1/3 of child's daily diesel pollution exposure.[6]
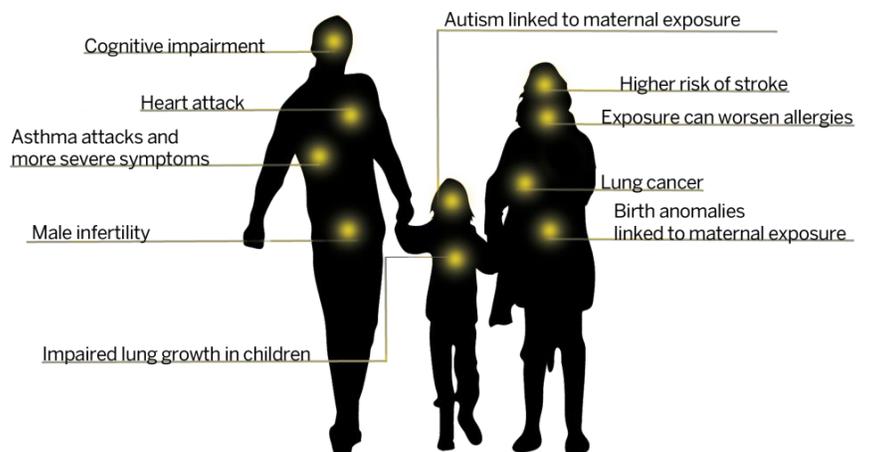
This problem can be solved:

Diesel school buses that are model year 2007 and newer are 99% clean and virtually eliminate harmful sources of pollution. Even though 68% of school buses in use by east Multnomah County school districts are pre-2007, these buses can be retrofitted with pollution controls that will reduce pollution levels between 30–95%, depending on the retrofit type.

A recent study in Washington State found that children riding on cleaner school buses reduced a marker for inflammation in the lungs by 16 percent over the whole group, and 20-31 percent among children with asthma, depending on the severity of their disease.[7] Moreover, children riding on cleaner buses had a 6-8% reduction in the risk of absenteeism. Bottom line, cleaner buses means healthier kids who are more ready to learn.

[1] U. S. Environmental Protection Agency. (2002). Health Assessment Document for Diesel Engine Exhaust. Washington, DC: National Center for Environmental Assessment, Office of Research and Development.

[2] Multnomah County Health Department. Report Card on racial and Ethnic Disparities 2011. Portland, OR.; 2011

[3] Fitz et al, Characterizing the range of children's pollutant exposure during school bus commutes, California Air Resources Board, 2003.

[4] Office of Environmental Health Hazards Assessment. (2001). Prioritization of Toxic Air Contaminants Under the Children's Environmental Health Protection Act. Sacranento, CA: California Environmental Protection Agency.

[5] Solomon et al, No Breathing In The Aisles, Natural Resources Defense Council, 2001.

[6] Behrentz et al, Relative Importance of School Bus-Related Microenvironments to Children's Pollutant Exposure, J. Air and Waste Mgt. Assn., 2005

[7] Adar et al, Adopting Clean Fuel and Technologies on School Buses: Pollution and Health Impacts in Children, Respitory and Critical Care Medicine, 2015.