

The Time Has Come to Electrify the Chicago Transit Authority Bus Fleet

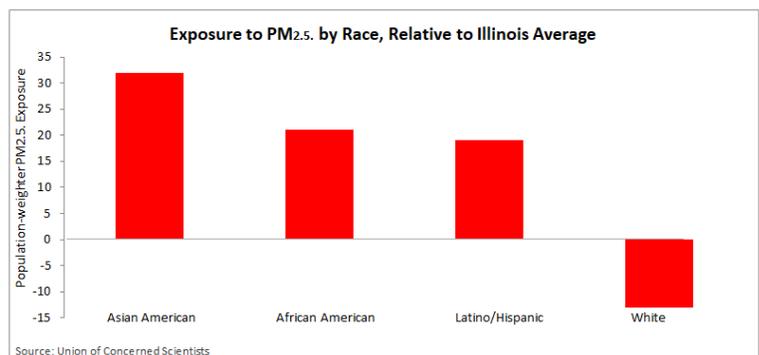
Air pollution is known to be a major contributor to adverse health outcomes. Particulate air pollution, which includes pollution from vehicles, contributes to increased asthma episodes, cardiovascular events, and premature death. Not surprisingly, a recent study also linked air pollution to increased COVID-19 mortality. In Cook County, Illinois (which includes Chicago), where residents are routinely exposed to high levels of particulate pollution, the latest health data highlight the importance of a coordinated effort to reduce particulate pollution. Several policy actions, including electrification of the Chicago Transit Authority's (CTA) 1600+ diesel buses, can help accomplish this.

Air Pollution and COVID-19 Linked: Air pollution, and particularly fine particle air pollution, can pose a serious threat to health. These particles can travel deep into the lungs. Exposure to PM_{2.5} has been linked to illness and death, most notably from lung and heart disease. We can now add COVID-19 to the list of health effects. In the first nationwide study of exposure to air pollution and COVID-19 mortality, researchers at Harvard University found that a small increase in long-term exposure to PM_{2.5} leads to a large increase in the COVID-19 death rate.ⁱ The study of 3,000 U.S. counties (covering 98% of the nation's population) found an increase of only 1 µg/m³ in PM_{2.5} is associated with an 8% increase in the COVID-19 death rate.

Researchers in Germany found that nearly 80% of deaths across four countries were in the most polluted regions.ⁱⁱ In the U.S., data on COVID-19 are available through the Coronavirus Resource Center at Johns Hopkins University & Medicine. As of May 4, 2020, the site reports that Cook County has the third highest number of confirmed COVID-19 cases and the fifth highest number of COVID-19 deaths.ⁱⁱⁱ

Cook County Ranks Among Highest in On-Road Air Pollution: Data about the health effects of particulate air pollution should be of great concern to local residents. A recent report issued by the Union of Concerned Scientists^{iv} found that Cook County ranks 8th among the nation's metropolitan counties with the highest exposure to on-road pollution. The county's exposure rate is 90% higher than the average of all U.S. counties with populations greater than 1 million residents.

The study estimated the amount of fine particulate matter air pollution (PM_{2.5}) created by vehicles like cars, trucks and buses. The study also found inequitable exposure to these pollutants across Illinois, with significantly greater levels of exposure among Asian Americans, African Americans and Latinx communities than the average exposure state-wide. The study did not take into account other additional sources of pollution exposure, such as industrial facilities, that also tend to disproportionately impact communities of color.



Electrified Buses — An Important Step Forward: Electrification of vehicles, including transit buses, is a clear and effective strategy for reducing local exposure to PM_{2.5}. A 2018 report noted that replacing the CTA's fleet of 1,653 diesel buses with electric buses would prevent nearly 55,000 tons of greenhouse gases every year, equal to removing more than 10,600 cars from the road^v.

While electrification will require an up-front investment, that investment will be more than recovered over the life of a typical CTA bus. While an electric bus costs an estimated \$225,000 over the purchase price of a typical CTA diesel bus, the CTA has recognized this investment is recoverable over the life of the bus. CTA estimates the reduction in harmful emissions by operating just one electric bus reduces respiratory diseases and other illnesses at a value of \$55,000 annually or \$660,000 over the expected 12-year lifespan of a bus.^{vi} Additional net fuel cost savings are estimated at more than \$25,000 per bus, or over \$300,000 over a bus lifespan. Applying these savings to the entire fleet of 1,653 diesel buses translates into over \$1 billion in health cost savings and \$495 million in fuel costs.



The CTA put its first electric bus on the road in 2014 and has started taking delivery on an order of 20 more. It was also awarded funds that may allow it to purchase up to 38 more. With a fleet of more than 1,600 buses, adoption of electric buses in Chicago must be accelerated.

Call To Action— It's Time to Switch to an Electrified Bus Fleet: In February 2020, the CTA issued a request for proposals to bus manufacturers for 100 more diesel buses and options for up to 500 more in future years, delaying the needed transition to a fully electric bus fleet^{vii}. Despite the clear benefits electric buses provide, higher up-front costs and the bus depot electric service upgrades needed to charge large number of buses remain barriers.

The Chicago area deserves a robust electric bus transit system – one that saves on long-term costs and protects the health of residents across the city. Elected leaders in the city of Chicago, the state of Illinois and the federal government need to dedicate resources for the CTA to accelerate a transition to cleaner, quieter, safer electric buses, so that the public will enjoy the health benefits they provide.

ⁱ Wu, X, Nethery, RC, Sabath, MB, Braun, D, and Dominici, F. Exposure to air pollution and COVID-19 mortality in the United States: A nationwide cross-sectional study. medRxiv preprint, April 27, 2020

ⁱⁱ Ogen Y. Assessing nitrogen dioxide (NO₂) levels as a contributing factor to coronavirus (COVID-19) fatality. Sci Total Environ. 2020 Apr 11;726:138605

ⁱⁱⁱ Coronavirus Resource Center, Johns Hopkins University and Medicine. <https://coronavirus.jhu.edu/us-map>. Accessed May 4, 2020

^{iv} Reichmuth, D. Exposure to air pollution from vehicles in Illinois is inequitable – It doesn't have to be. Union of Concerned Scientists. February 19, 2020

^v U.S. PIRG Education Fund, Frontier Group, Environment Washington Research & Policy Center. Electric buses: Clean transportation for healthier neighborhoods and cleaner air., May 2018

^{vi} Chicago Transit Authority. Electric Buses. <https://www.transitchicago.com/electricbus/> retrieved February 18, 2020

^{vii} Chicago Transit Authority. Advertisement for professional services. https://www.transitchicago.com/assets/1/6/20FT102342998_TX_Letter.pdf?24824