

Memo to: Metro Board Members
From: Metro Electric Bus Coalition
Re: Why Metro Must Transition Quickly to Zero-Emission Buses
Date: April 13, 2022

The Metro Electric Bus Coalition is urging Metro to move as quickly as possible to transition to a zero-emission bus fleet to protect public health and help avoid the worst consequences of climate change. Metro's current target date to electrify its fleet by 2045 is not soon enough.

Fossil Fuel Buses Threaten Public Health

The transportation sector accounts for [more than half](#) of the toxic air pollution in the country, and buses and heavy-duty trucks are major contributors. Although they only comprise about 4 percent of all U.S. vehicles, they are the [biggest source](#) of nitrogen oxides and particulate pollution on the road.

Vehicle pollution kills. More than 20,000 Americans died prematurely in 2015 as a result of vehicle tailpipe emissions, according to a [2019 study](#), which attributed 43 percent of those deaths to diesels. Another [recent study](#) estimated that exposure to vehicle pollution killed 7,100 Northeastern and Mid-Atlantic state residents in 2016.

Diesel tailpipe pollution also has been linked to [cancer](#) and respiratory and [heart](#) disease. Although they no longer spew plumes of black soot, diesel and diesel electric hybrid buses still [emit](#) a toxic brew of gases—including carbon dioxide, carbon monoxide, nitrogen oxides and hydrocarbons—and fine particulate matter, including carbon, organic materials and metallic compounds. These minute particles bypass respiratory system defenses and lodge deep into lungs. Once there, they stimulate an immune response that triggers inflammation, airway constriction, mucus production, and asthma symptoms. [Some studies](#) suggest that diesel exhaust not only aggravates asthma, but also may cause it. Nitrogen oxides, meanwhile, combine with volatile organic compounds to produce ground-level ozone, or smog, which is so bad in the D.C. metropolitan area that the American Lung Association's most recent [State of the Air report](#) gave our region an ozone grade of F.

Diesel bus emissions no doubt threaten the health of bus riders and people who live and work along bus routes, but they especially threaten the health of Metro employees. According to a [2020 study](#) by the MRC Centre for Environment and Health at Imperial College in London, England, professional drivers—including bus drivers—have a greater risk of cancer than the general population because they are routinely exposed to diesel exhaust.

Although buses that run on compressed natural gas (CNG) emit 90 percent less nitrogen oxides as conventional diesel buses, according to a peer-reviewed [2016 study](#), they emit 71 percent more [carbon monoxide](#), which aggravates childhood asthma and increases cardiovascular disease, and 2,320 percent more [hydrocarbons](#) (including methane), which have been linked to lung disease and neurological problems.

Nitrogen oxides and methane both contribute to the formation of smog, which [exacerbates](#) allergies and lung conditions, including emphysema, bronchitis and asthma. Asthma is a major health problem in the District. The Centers for Disease Control and Prevention (CDC) [estimates](#)

that 11.4 percent of D.C. residents suffer from the disease, nearly 40 percent more than the national average of 8.2 percent. Only four states—Maine, New Hampshire, Vermont and West Virginia—have a slightly higher percentage.

The CDC data, which is from 2019, includes adults and children. Another [data set](#), which calculated the prevalence of asthma that same year for children only, found that 11.7 percent of children in Washington, D.C., suffer from asthma, a higher percentage than any state in the country.

Metro buses exacerbate the problem. The District does not provide school buses for all public school children, so they often rely on Metro buses to get to class. Given that children’s lungs are not fully developed and they breathe [50 percent more air](#) per pound of body weight than adults, they are more vulnerable to tailpipe pollution.

Washingtonians, it should be noted, are not affected equally. Asthma rates are significantly higher in low-income neighborhoods. For example, the D.C. Department of Health found that in 2014, 17.6 percent of adults living in Ward 8 had asthma, while only 5.8 percent of the adults in Ward 2 suffered from it.

No one is suggesting that Metro’s bus fleet is solely responsible for the high asthma rates in our city, let alone the incidence of lung cancer and heart disease, but toxic emissions from buses that drive up and down local streets every 20 minutes, 14 hours a day, seven days a week, no doubt pose a threat to the health of D.C., Maryland and Virginia residents.

Fossil Fuel Buses Worsen Climate Change

The transportation sector today accounts for nearly [a third](#) of U.S. carbon emissions, edging out the electric power sector as the top source for global warming pollution. Again, heavy-duty trucks and buses, which—as aforementioned—make up only about 4 percent of all U.S. vehicles, are major contributors. They are responsible for [nearly 25 percent](#) of total transportation sector carbon emissions, which amounts to more for more than [420 million tons](#) of carbon pollution every year—more than the entire output of Australia.

In Washington, D.C., transportation is the second-largest source of carbon emissions, accounting for about [25 percent](#) of the city’s output, while in the greater D.C.-Maryland-Virginia region, it accounts for a whopping [40 percent](#).

Take the issue of warming temperatures as a prime example of how unchecked climate change will impact Washington residents. Last summer, Washingtonians suffered through [42 days](#) at or above 90 degrees Fahrenheit between January 1 and August 25, just a few days more than the historical average. If we don’t move quickly to establish a clean energy economy, it is going to get a lot worse.

The Union of Concerned Scientists issued a [report](#) in 2019, *Killer Heat in the United States: The Future of Dangerously Hot Days*, which calculated just how bad it will get for cities and counties across the country if we do not act, and act soon.

Here’s what UCS found for the District:

Historically, Washington, D.C., has experienced an average of 39 days per year with a heat index above 90 degrees F, including seven days above 100 degrees and two days above 105 degrees.

If we fail to dramatically cut carbon emissions, by midcentury, the District would experience an average of 83 days per year with a heat index above 90 degrees, including 41 days above 100 degrees, 23 days above 105 degrees, and two days at or above 127 degrees. By late century, the District would experience an average of 111 days per year with a heat index above 90 degrees, including 68 days above 100 degrees, 48 days above 105 degrees, and seven days at or above 127 degrees.

On the other hand, if we quickly slash carbon emissions and, under the 2015 Paris climate agreement, limit future global average warming to 3.6 degrees (2 degrees Centigrade) above pre-industrial temperatures, we could limit the increase in extreme heat in the District to an average of 77 days per year with a heat index above 90 degrees, including 30 days above 100 degrees and 14 days above 105 degrees. No picnic, but nowhere near as bad if we do not act—and act decisively.

Given the potential for this uninviting future, fossil fuel buses—indeed fossil fuel vehicles of all kinds—*must be replaced as soon as possible*. Neither diesel, diesel electric hybrids, nor CNG buses could be considered low-emission alternatives compared to electric buses.

Even so, Metro is not only planning to continue to buy diesel and CNG buses until 2030, it also plans to increase the percentage of CNG buses in its fleet to roughly half and spend more than \$5 million on a new CNG fueling facility, despite the fact that lifecycle carbon pollution from CNG buses is at most 6 percent lower than that of conventional diesel buses, according to the Department of Energy's Argonne National Laboratory, and—in many circumstances—nearly the same.

When comparing lifecycle carbon emissions, electric buses are superior to fossil fuel buses across the country, no matter where they get their electricity. It is important to set the record straight on this issue, because a Metro board member falsely asserted that electric buses are not necessarily any cleaner than fossil fuel buses if they get their power from coal or natural gas power plants. In fact, electric buses in the Washington metropolitan area would have 70 percent lower lifecycle carbon emissions than diesel buses, 65 percent lower than natural gas buses, and 60 percent lower than diesel electric hybrids based on 2016 Environmental Protection Agency power plant emission data, according to a Union of Concerned Scientists [analysis](#). And the good news is the electricity grid in our region has gotten cleaner over the last six years, so lifecycle electric bus emissions now would likely be around 5 percent lower.

###

The Metro Electric Bus Coalition includes: ANS (formerly Audubon Naturalist Society), D.C. Environmental Network, Earthjustice, Electric Vehicle Association of Metropolitan Washington, Faith Alliance for Climate Solutions, Green Latinos, Greenpeace USA, Loudon Climate Project, Maryland Legislative Coalition, Moms Clean Air Force, Northern Bus Barn Neighbors, Northern Bus Garage Community Environment Committee, Sierra Club D.C. Chapter, Sierra Club Maryland Chapter, Sierra Club Virginia Chapter, and Union of Concerned Scientists.