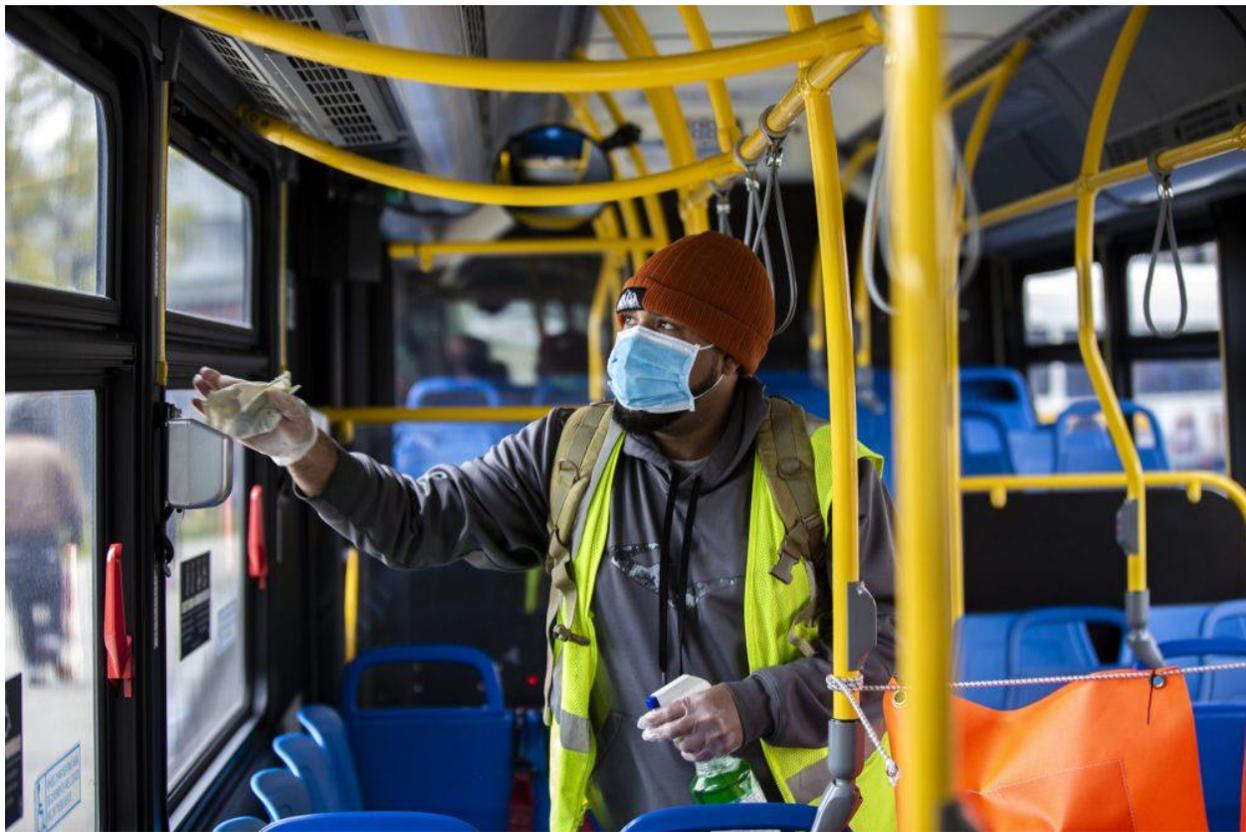


How's The Air In There? A Look At Ventilation On The MBTA

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Marino Diaz Cruz wipes down the surfaces inside an MBTA bus with disinfectant after it pulled into Ashmont Station from Jackson Square. (Jesse Costa/WBUR)

More people are riding the T now that schools and workplaces are open. And the MBTA expects ridership to keep increasing through the fall. That could mean more crowding and more concerns about transmission of the coronavirus.

Public health experts say good ventilation can help reduce the spread of the virus, but it may not be something many MBTA riders are thinking about.

"I have to focus on the fact that I need to get from point A to point B no matter what, because I have things that I need to progress on," said Joel Diaz as he waited to catch a bus in Cambridge's Central Square on a recent weekday.

Diaz is focused on getting to his new job as a shift supervisor at MIT. He's also trying to keep his distance from people to protect himself from the coronavirus. He usually rides the train but said it's been too crowded lately.

"This is my first time riding the bus in a very long time. So I'm excited to see how that goes," Diaz said.

Riders at the bus stop along Mass. Ave. wore masks, some had hand sanitizer, and others said they would even wait longer to avoid a crowded bus. But ventilation wasn't a concern among most riders there.

"Not yet. Hopefully that's not the next thing you know," said Vanity Reyes, who relies on the T and was on her way to Boston Medical Center.

Ventilation is a concern for public health experts as more people head back to indoor spaces like [schools](#) and offices as well as public transit. There's growing evidence the coronavirus can linger in the air and some [case studies](#) have linked poor ventilation indoors to the spread of the virus.

So how does ventilation work on, say, a bus?

"Near the front of the bus right as you're boarding it, if you were to look up, you would see kind of a big grill, and that's the air intake," said Brian Dewsnup, the president of NFI Parts, which supplies parts for New Flyer — the company that makes most of the MBTA's 1,090 buses. "So air comes up into that. It then goes through the air conditioning system. And then it comes out back into the passenger cabin kind of along the sides of the bus."

The air passes through a filter before it comes back out, and the system recirculates the air in the bus. Dewsnup said bus ventilation isn't that different from the systems in an office building or grocery store. But, buses do have a unique advantage.

"Buses naturally probably have more fresh air than any of those environments because, as you know, the doors on the bus open pretty frequently," Dewsnup said. "And so you're getting interchange of air, probably better than any building or office setting that you would go into."



A man, wearing a protective face mask, rushes to catch his bus at Dudley Station in Nubian Square on June 24, 2020, in Boston. (Charles Krupa/AP)

The MBTA said the air on its buses is replaced 10 to 13 times per hour, depending on how many times the doors open along a route. The T's subways have 11 to 28 air changes per hour, and the commuter rail has about 10 air changes per hour, according to the transit agency.

Public health experts recommend bringing in as much outside air as possible. And that could be as simple as cracking a window. Joe Allen, an assistant professor at Harvard's T.H. Chan School of Public Health, has studied air circulation on school buses.

"When we rolled down the windows a little bit when the bus is moving, we got 20 to 40 air changes per hour," Allen said. "And air change per hour to put numbers on it: Six air changes per hour is every 10 minutes the full volume is refreshed, the full volume of the space. So, you know, 20 air changes per hour and you're getting up to every couple of minutes."

The windows on MBTA buses are closed. The T unlocked them early on in the pandemic in March, but closed them again in May when temperatures began to rise. High temps can make the HVAC systems less effective, according to the transit agency. And as temperatures cool, opening them back up may not be feasible.

Upgrading the air filters on public transit is also important to help clear the air of tiny particles, according to Krystal Pollitt, an assistant professor of epidemiology at Yale.

"You don't just want to reintroduce air that someone may have expelled infectious viral material into, you want to have some attempt at filtering out that airborne virus," said Pollitt, who is working with the Connecticut Department of Transportation on their ventilation systems.

Air filters are rated on a scale of 1 to 16 based on their ability to block particles. This is also known as their minimum efficiency reporting value or [MERV](#). The higher the MERV rating, the better the filter is at trapping small particles. The MBTA said the filters on its buses are a level 4 or higher (some are a level 7) and are replaced once a month. The T said it's also working to upgrade its air filters to the maximum level the HVAC systems can accommodate.

"Ventilation is an important factor, but it's only one factor," said former state transportation secretary Jim Aloisi, who teaches transportation planning and policy at MIT. "There are many factors that go into the equation of COVID-19 safety on transit. It's ventilation, it's duration, it's protection — mask wearing — and proximity. And if you can get all of those factors, some of them are only in the T's control. Some of them, one of the most important like mask wearing, that's in the riders' control."

Aloisi said if all of those factors are addressed properly, the risk of taking public transit is pretty low.



An outbound MBTA Blue Line train on its way to Orient Heights Station in East Boston. (Jesse Costa/WBUR)

The T has already [ramped up](#) cleaning procedures. And transit advocates point out that plenty of people have been using public transportation safely throughout the pandemic.

"The ventilation systems that are operating now are the same ventilation systems on the buses and trains that were operating in February that were moving essential workers safely to their jobs," said Stacy Thompson, the executive director of the LivableStreets Alliance. "You know, the real issues are masks and crowding."

Transit advocates say a big concern is that riders don't get packed too closely as more people use the system. The T has [increased service](#) on some of the more crowded routes, but some riders and advocates say it's not enough, particularly in areas where many people rely on public transit.

"I guess I wish they would they would increase it, you know, even more. That more buses would have more drivers and more service and more routes so that folks can really physically distance," said María Belén Power, the Associate Executive Director of GreenRoots, an environmental justice organization based in Chelsea.

Longer term, that may be a challenge for the T because the agency faces a [major budget gap](#) and is considering permanent cuts in service.

This segment aired on September 28, 2020.