EXHIBIT 7

PUBLISHED REPORTS ON THE UNRELIABILITY OF ELECTRIC BUSES

1. Shocker: Reliability Issues Could Delay 200 New Zero-Emission Buses This Year - Streetsblog New York City

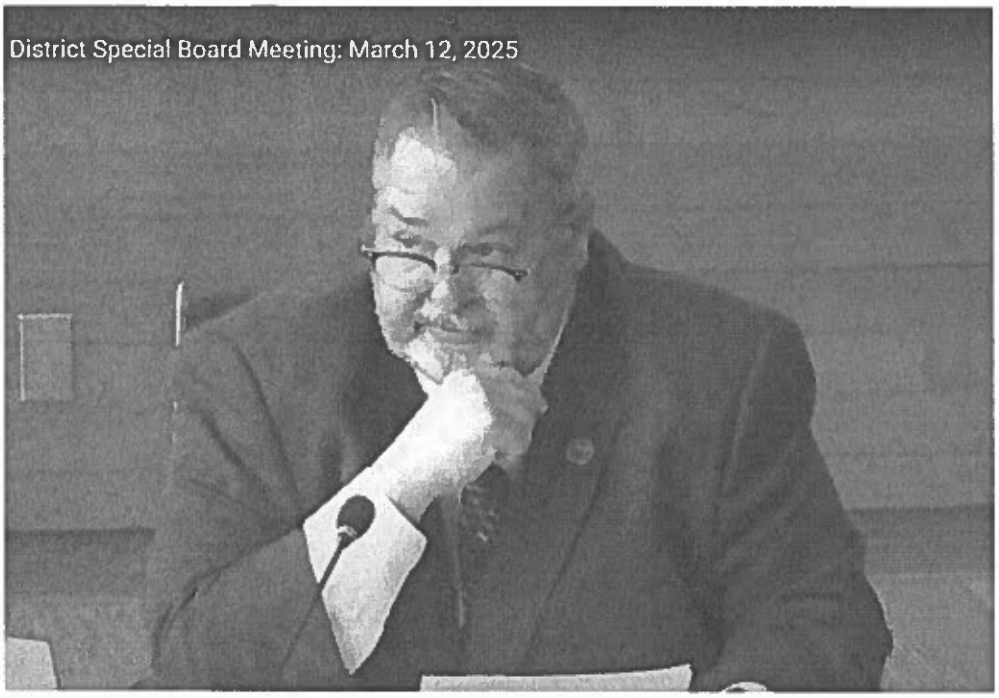
2. Another Biden Fiasco—Electric Buses - I ER

3. Everett's electric bus fleet faces setback, city turns to retrofitted diesel buses for now

4. Cap Metro stops shift to al l-electric bus fleet I KUT Radio, Austin's NPR Station

5. LTD reports reliabi lity and range issues with its electric buses - Whole Community News

6. Delta Replaces Engine Units in Effort to Address Toxic-Fume Surge on Planes



0:00 / 11:09

Presenter: After encountering reliability issues and range anxiety, the Lane Transit District hopes to reduce the number of electric buses in its fleet. At the board meeting March 12, Chief Operating Officer Mike Hursh:

Mike Hursh (LTD, COO): Today, I will be briefing you on our experience operating and maintaining zero-emission battery buses. We currently have 30 New Flyer electric buses. This is almost 30% of our fleet. That's a very high number for any fleet in the United States right now.

[00:00:28] For some history: In 2017, Lane Transit District made its first attempt to integrate battery electric buses into its fleet, spending $4 million on five electric BYD—stands for Build Your Dreams, a Chinese company bus manufacturer.

[00:00:44] After two years of issues, lack of vendor support, and very limited revenue service time, these buses were ultimately returned to the manufacturer.

[00:00:52] BYD has since essentially been banned from selling transit buses in the U.S. due to Buy America requirements. The good news is fortunately that LTD was able to recoup the $4 million from that first venture.

[00:01:04] Challenges with transition to battery buses is not unique to LTD. Both Reno, Nevada and Albuquerque, New Mexico returned significant number of buses and even in California with the 2040 mandate to transition all buses, most agencies are discussing slowing plans while the struggle with the high capital costs, lack of great capacity and range anxiety continue to grow.

[00:01:29] In keeping with LTD commitment to reduce our carbon footprint, 11 battery buses were purchased from New Flyer in 2019, followed by 19 more New Flyer battery buses in 2021, costing close to $30 million.

Public comment: Eugene is violating Oregon statutes, constitutional rights (https://wholecommunity.news/2025/09/10/public-comment-eugene-is-violating-oregon-statutes-constitutional-rights/)

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[00:01:44] It should be noted that since we made our purchase, the availability of manufacturers has been cut in half with BYD banned, Proterra and ElDorado going out of business, leaving essentially Gillig in California and New Flyer in Anniston, Alabama as the currently only viable suppliers.

And the average battery bus price has increased 30% to 35% since the pandemic. It's basically $1.3 million for a battery bus compared to $800,000 or $900,000 for a diesel bus.

[00:02:15] We coincidentally had a meeting with Gillig this morning and they informed us in addition to normal producer price index increases, we can expect a 2% to 4% tariff increase for the next buses we purchase.

[00:02:31] Today, an average of approximately half, nearly 17 of the LTD battery fleet is not available for service on any given day. As many as 23 buses have been down at one time. The most we've ever had available for service on one day is 25.

[00:02:47] Hiring, training and building proficiency to our mechanics is one of our greatest challenges. It's very rare to hire a standard bus mechanic. It's even rarer to find a battery zero emission bus mechanic or technician.

[00:03:01] I want to talk a little bit about range variation on hot and cold days. The bus has much different traveling distances. Imagine your family vacation. One day you fuel your car, you can go 200 miles on a normal day, the next day a cold or hot day, you can only go 80 or 90 miles with that same amount of fuel in your tank. That is incredibly difficult to schedule reliable public transit with those challenges.

Defects that drive bus down times have consistently been related to the electric propulsion system issues. And again, that's not unique to Lane Transit. That's what we see in the industry.

[00:03:37] We've had a lot of problems with batteries. We've replaced 32 individual batteries since operating the New Flyer buses. Diagnosing, replacing and balancing a high-voltage battery is a very time-consuming effort as there are 35 to 42 individual batteries depending on the year of manufacturer for the bus. Even with improvements, downtime for this defect is excessive.

[00:04:01] Congratulations and kudos to the LTD team who has recently been able to improve repair time for defective batteries significantly from an average of six weeks down to an average of two weeks. This was done through the procurement of specialized battery test equipment at a cost of $50,000.

However, two weeks is a long time for a bus to be out of service. Even with the improvement, it's still hamstringing our ability to provide all the buses necessary for a day of service. The batteries are warrantied for 12 years, but because we use federal dollars, the buses are required to operate for 12 years of service.

[00:04:39] There's another issue we challenge, which is essentially the equivalent of a 'Check engine' light in your car. You can go to the maintenance shop and have that scanned. For us, we are required to use a data logger and operate the bus for two to four hours, and then send those data logs to New Flyer, which sometimes can take multiple days to the engineers to analyze the data. Sometimes they need more data.

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[00:05:03] From the days of an original combustion engine bus to now, there are 18, a minimum of 18 microprocessors on your typical zero-emission bus. Trouble shooting alone can take one to three days. Looking ahead, New Flyer is still modifying the system. We were notified of a recall affecting five of our buses just this week. Essentially, these buses are an in-service research and development project.

[00:05:29] Gillig has been very late to the market. Time will tell. Capital costs remain extremely higher. And we were told today that if we purchase a battery bus from Gillig, the lead time is a minimum of two years. The more types of buses from a technology perspective, the more parts we have to have in stock and newer technology parts tend to take longer to procure.

[00:05:50] Finally, the challenges of the zero-emission fleet has required us to hold on to older buses and maintain a larger fleet in order to sustain service. This hits us with associated labor capacity issues as higher and higher parts, labor cost issues.

[00:06:04] **Presenter:** LTD Board Member Pete Knox:

[00:06:07] **Pete Knox (LTD, board member):** I've been reading about some of the challenges other transit agencies have been having with battery electric buses and want to kind of understand some of the problems that we're having a little bit better.

[00:06:18] So the battery packs on the bus are multiple cell battery cells. Is that correct? (Correct.) So if one of those goes down, the whole thing goes down. Is that…?

[00:06:31] **Mike Hursh (LTD, COO):** Depending on the severity of the failure in that individual cell, the entire bus can go down. Or at a minimum you get degraded performance, again, leading to range anxiety.

[00:06:40] In the industry, there have also been a problem with batteries lighting off. There are several transit agencies that have lost multiple buses due to fires in the battery compartment.

[00:06:51] **Pete Knox (LTD, board member):** And then you say the point of failure is that electric motor?

[00:06:55] **Mike Hursh (LTD, COO):** In my experience, electric motors have not been the failure. It's been inverter and battery cell challenges. And then again, various microprocessors that will throw a fault code and have to be sent to the manufacturer and they give us magic things to say change this component without really understanding, again, because of proprietary technology, what's failed on that particular component or board. –

[00:07:17] **Pete Knox (LTD, board member):** Okay, I get it, it's the battery and the delivery of the power to the system that's the real point of failure.

[00:07:25] **Mike Hursh (LTD, COO):** Correct. And I should share, you know, I'm new to the state of Oregon. I just spent 32 years in California. In California, we can't even get the electricity to charge the buses. So you're blessed here having the availability of electricity, but you still have the range anxiety because of the weather swings that we experience here.

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CATEGORIES

Alsea River watershed (https://wholecommunity.news/category/a river-watershed/)

[00:07:43] **Pete Knox (LTD, board member):** Do we have a federal requirement for how many buses we keep in service?

[00:07:49] **Mike Hursh (LTD, COO):** Any bus that is procured with federal dollars is required to operate for 12 years. If you don't operate it for 12 years, you have to repay the remaining federal interest back to the Federal Transit Administration (https://www.transit.dot.gov/). There's no federal requirement for zero-emission buses and I don't foresee one at least for the next four years.

[00:08:06] **Presenter:** LTD Board Member Gino Grimaldi:

[00:08:09] **Gino Grimaldi (LTD, board member):** So the timeline again. We bought the first buses what year?

[00:08:12] **Mike Hursh (LTD, COO):** 2017 and 2019.

[00:08:15] **Gino Grimaldi (LTD, board member):** And when did we start experiencing —

[00:08:18] **Mike Hursh (LTD, COO):** From day one. (From day one.) From day one. In fact, New Flyer is still here. The buses are still under warranty and much of the warranty work is done by New Flyer technicians.

[00:08:28] **Gino Grimaldi (LTD, board member):** I know you weren't here, but I wonder why we continued to purchase problematic buses.

[00:08:34] **Mike Hursh (LTD, COO):** Yeah, I can speculate on that. The battery electric industry in particular, really did an excellent job of marketing to policymakers, and they were just blatantly, I'll say it, dishonest about the range.

[00:08:47] And then as soon as we saw large fleets getting delivered, Albuquerque and Reno are two examples, the truth came out. Now the truth is out.

[00:08:55] Even in California with the 2040 mandate, they're all looking, and I just came from an agency that was the leader in zero emission. We're all looking for ways to back off because of the, just the cost, the, yet the reliability or, and for agency of our size, 30% is far too many.

[00:09:11] **Presenter:** Board Member Susan Cox.

[00:09:13] **Susan Cox (LTD, board member):** Do I remember at one point, one of the buses caught fire and burned before it even was delivered? … Sobering.

[00:09:21] **Presenter:** LTD CEO Jameson Auten:

[00:09:23] **Jameson Auten (LTD, CEO, March 12, 2025):** The last bus procurement this board approved was for diesel vehicles and we use renewable diesel, which is R99, which is in compliance with the alternative fuels as well. We're going to look to see how we can reduce the percentage of electric buses in our fleet. Mike mentioned several times California has a mandate. We started to reach out to different agencies in California to see if there's any interest in the buses that we have and having us replace those with diesel vehicles.

[00:09:59] Again, that 30% number is very high. I don't know the decision in '19 or '21 to go with that percentage, but we do know that it's been problematic to make service and really have to give hats off to Eric's maintenance team over there

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Coos Bay watershed (https://wholecommunity.news/category/c

making that magic happen because we do make service. It's just incredibly hard.

[00:10:22] So we're going to kind of sniff the industry a little bit and see if there's some interest. And if we can increase our percentage of diesel buses using the R99 to remain in compliance, we think that'd be a good solution.

[00:10:36] **Presenter:** Gino Grimaldi:

[00:10:38] **Gino Grimaldi (LTD, board member):** Well, thank you. It's never easy to deliver news like that, but I think it's refreshing to know that we have staff that are willing to admit that we've taken the wrong path and need to take a different path. So, thank you all.

[00:10:51] **Presenter:** With an average of 17 of its 30 electric buses not in service on any given day, LTD shares plans to reduce the number of electric buses in its fleet.

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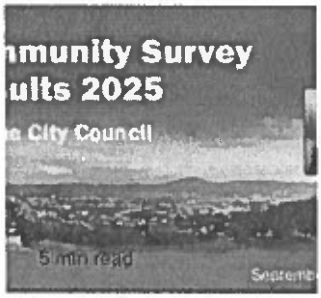

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CapMetro stops shift to all-electric bus fleet

KUT 90.5 | By Nathan Bernier

Published July 25, 2024 at 4:11 PM CDT

LISTEN • 8:00

Nathan Bernier / KUT News

Capital Metro buses, both diesel and electric, parked at the transit agency's operations and maintenance center on McNeil Drive north of U.S. 183.

Lee esta historia en español

Capital Metro is slamming the brakes on an ambitious goal of transitioning to an all-electric bus fleet, citing problems with the range of battery-electric buses.

Austin voters were promised a transit system with exclusively electric vehicles when they authorized a tax increase in 2020 to fund Project Connect, the largest transit expansion in the city's history. Zero-emissions buses are quieter and don't blast hot exhaust in the faces of people on the sidewalk.

KUT
Texas Standard

CapMetro provides more than 24 million rides per year, including to Jude, age 6, during the ATX Kids Club Summer Camp.

"Honestly, we thought and hoped that the technology would progress a little faster than it has," CapMetro CEO Dottie Watkins told KUT. "The biggest downside of a battery-electric bus today is its range."

Diesel buses can run from early in the morning until past midnight. A battery bus only runs about 8 to 10 hours before it needs to be recharged, creating tough logistical hurdles in scheduling routes.

An analysis by the Texas Transportation Institute (TTI) — a state-funded research agency at Texas A&M University — found battery-electric buses could only cover 36% of Capital Metro's bus schedules.

"If [the route] is too long, it won't make it," said John Overman, a research scientist with TTI. "You're going to have to charge them mid-route or wherever it is." Austin's hills drain batteries faster. So does trying to cool buses in the city's oppressive heat.

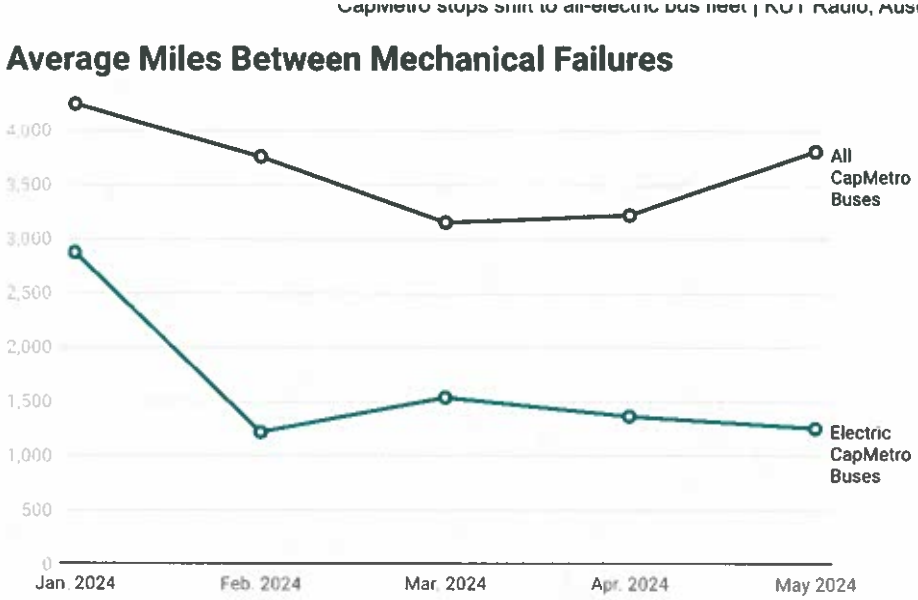
Karina Lujan / KUT News

Keeping buses cool in the Texas heat requires extra energy that drains bus batteries faster.

But range shortcomings are only part of the problem.

Data obtained by KUT through the Texas Public Information Act revealed CapMetro's battery-electric buses are far less reliable than their diesel counterparts. E-buses had mechanical failures on average every 1,623 miles over the last year — less than half the typical distance between failures for the fleet as a whole.

KUT
Texas Standard



Mechanical problems, coupled with challenges in procuring parts and doing repairs, mean battery-electric buses are often unavailable for service. In 2022, almost 52% of e-buses were down, on average. In 2023, the number of vehicles out for repair improved slightly to an average of just under 50%.

"Getting the expertise up and being able to have those vehicles be as reliable as our old workhorse diesel buses have been is a challenge," Watkins said. "It's something that we are up to."

On top of range and reliability issues, both companies Capital Metro hired to build its battery-electric buses faced major financial challenges. Proterra and New Flyer blamed the problems on pandemic-related supply chain issues and inflation that drove up manufacturing costs after major contracts were signed.

One of the two bus builders didn't survive.

Proterra, a company from the San Francisco Bay area, went bankrupt last year and sold off the firm in pieces to pay back debtors. The new owner of Proterra's e-bus business — Anaheim, California-based Phoenix Motorcar — still has no battery provider or vehicle software ready to deploy, TTI's Overman said.

The other supplier — New Flyer — bled almost $300 million after the pandemic but appears to have staunched the wound. The Winnipeg, Canada company reported a smaller loss of $9 million in the first quarter of 2024 thanks to record-breaking order numbers.

CapMetro is operating 23 battery-electric buses among a fleet of 402 buses, not including commuter buses or shuttle buses. Another 87 e-buses already ordered are expected to be delivered by the end of the year. Some will replace aging diesel vehicles.

Once all the e-buses arrive, Watkins says, about a quarter of CapMetro's fleet will be battery-powered. The agency will then "sit for a minute while we wait for the battery

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'Not as easy as it seems'

By most measures, CapMetro is a leader in the shift to an all-electric fleet. With 25% electric buses, the transit agency's adoption rate would exceed that of countries with far more political and financial support for zero-emissions vehicles like Belgium, Norway and Switzerland.

"China is a leader in electric bus sales, and about a quarter of the bus fleet in China is electric today," said Elizabeth Connelly, a transportation electrification researcher at the Paris-based International Energy Agency. "So if Austin's reaching that same level, I think it's nothing to scoff at. I think it's pretty impressive."

Nathan Bernier / KUT News

Capital Metro has 23 battery-electric buses in the fleet with 87 more already on order and expected to arrive by the end of the year.

Santiago, Chile — considered a world leader in electric bus adoption — has 30% of its fleet running on batteries, Connelly said.

"Reaching the 100% level can be fairly tricky," she said. "It's not as easy as it seems."

New buses ordered by Capital Metro over the next two to three years will be hybrid diesel vehicles, which are electric buses powered by an on-board diesel generator. The transit agency also wants to use federal grants to buy a small number of hydrogen fuel cell buses, an even more cutting-edge and untested technology than battery-electric buses.

The hybrid and hydrogen vehicles would have a similar range to a diesel bus, Watkins said.

A big bet on young technology

Capital Metro announced the shift to an all-electric fleet in 2018 under then-CEO Randy Clarke. The next year, Clarke invited TV cameras to watch a demolition crew smash down an old mattress factory to make way for a bus charging yard in North Austin.

"This is it!" Clarke exclaimed to reporters. "We're knocking down an old facility ... to build the bus fleet facility of the future."

KUT
Texas Standard

Mose Buchele / KUT News

Workers look on after a mattress factory was torn down in 2019 at the site of what is now a bus-charging facility in North Austin.

Later that day, the CapMetro board followed suit, authorizing the agency's largest electric bus purchase ever at the time: 10 vehicles from Proterra. Each bus cost more than a million dollars, almost twice as much as the diesel buses approved for purchase the same day.

"We're going to be able to save money, provide a better customer service and deal with climate change issues," Clarke pledged to the board. In 2022, Clarke left Austin to lead the transit system in the Washington, D.C. area.

Proterra / Capital Metro

This marketing image of a Proterra battery-electric bus was presented to CapMetro board members before they approved an $11 million contract for 10 buses and associated charging equipment in 2019.

Some were hesitant about betting big on emerging technology. Eric Stratton, a Williamson County representative then just four months into his tenure on the CapMetro board, wondered if Proterra would be able to stand by its relatively new product.

"So that five years in, six years in, eight years in, [if] things start happening, we've got the support behind it so we can continue to maintain it. Do you all feel comfortable this is the case?" Stratton grilled Watkins, then vice president in charge of bus services.

"Yes, that is indeed the case," said Watkins, enthusiastic about the future of electric propulsion. "Proterra's a very strong partner and I have no concerns at all that they won't be able to support the bus for the full life of the bus."

KUT
Texas Standard

The board gave unanimous approval to the $11 million contract. But that was just the beginning.

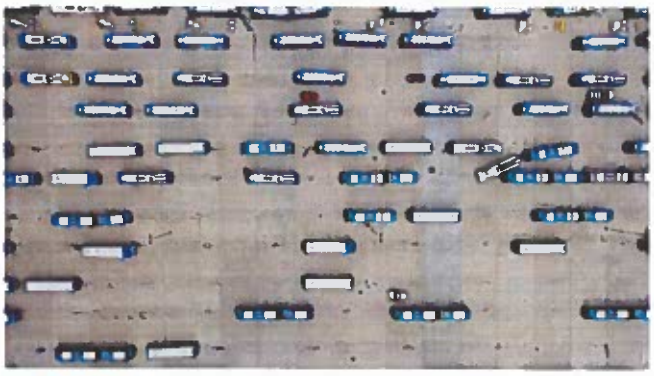
In 2021, the board shoved its stack of chips on the table. Capital Metro would plop down up to $255 million for 197 electric buses. This time, the deal would be split between two manufacturers: Canada's New Flyer and Proterra, the politically connected California firm that hosted President Biden for a virtual tour earlier that year.

Long before CapMetro received all its electric buses, Proterra would be in a Delaware bankruptcy court chopping up the company and selling it off in pieces. Transit agencies across North America revealed private concerns in public court fillings, alleging the buses were mechanically unreliable, lost range in adverse weather and in rare cases would burst into flames.

Capital Metro admitted at the time of the bankruptcy proceedings that the shift to an all-electric fleet was hitting speed bumps.

"The reliability of electric buses no matter the manufacturer is less than a diesel bus. I'm not going to tell you they operate as well as diesel bus," CapMetro chief operating officer Andy Skabowski told KUT last December. "We're going to see some vehicles that are down a little bit longer than a diesel bus."

Back to the future



Nathan Bernier / KUT News

An overhead view of buses parked at CapMetro's North Ops facility on McNeil Drive north of U.S. 183.

While the shift to an all-electric fleet might be another Project Connect promise later revealed to be unrealistic — like the plans for a downtown subway system with underground shopping and dining — CapMetro has achieved other goals in the voter-approved transit expansion, even if some are running behind schedule.

A new CapMetro Rail station opened at Q2 Stadium, an additional set of rail tracks has been installed between Lakeline and Leander to allow for increased train frequency, more Pickup zones are being added and park and rides are under construction.

KUT
Texas Standard

Michael Minasi / KUT News

Construction workers putting the final touches McKalla Station at Q2 Stadium before it opened in February.

A pair of high-frequency bus lines — one from the Travis County Expo Center to downtown and another from southeast Austin to northeast Austin — are on track to begin operations in 2025, two years behind schedule.

Those CapMetro Rapid lines were promised to be run exclusively with electric buses. But end-of-line fast-chargers to top off bus batteries during the day might not be installed at park and rides in time for the routes to be all-electric on launch day.

"We likely are not going to wait until that infrastructure is complete, though, to put any service on those routes," Watkins said, but was unable to say when the new high-frequency routes would be run exclusively with e-buses.

Capital Metro now argues that having a reliable transit service, even with diesel buses, is better for the city and the environment than less reliable public transit with an all-electric fleet.

"If nobody wants to use the services, then we're not going to have a good system in which people will continue to use it, which gets other vehicles off the street," Stratton, the CapMetro board member, told KUT. "If that involves a stopgap measure to still ensure that we have the reliability on our system ... we're going to continue to do that now and into the future."

Tags Transportation | KUT | Electric Vehicles | Public Transportation | Cap Metro | Trending

Nathan Bernier

Nathan Bernier is the transportation reporter at KUT. He covers the big projects that are reshaping how we get around Austin, like the I-35 overhaul, the airport's rapid growth and the multibillion-dollar transit expansion Project Connect. He also focuses on the daily changes that affect how we walk, bike and drive around the city. Got a tip? Email him at nbernier@kut.org. Follow him on X @KUTnathan.

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Another Biden Fiasco—Electric Buses

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FEBRUARY 5, 2024

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Key Takeaways

1

The Biden administration continues to push electric buses despite problems showing up around the country as range, reliability and expenses are turning out to be much different than advertised idling many of them.

2

EV buses cost multiple times more than their diesel counterparts, and their performance is marred by expensive and frequent repairs, charging equipment costs and much lower range than existing buses.

3

Cities and school districts are left holding the bag, even as the Biden administration uses celebrity spokespeople like Vice President Kamala Harris and Energy Secretary Jennifer Granholm to pitch Americans on them.

Between the federal government, states and municipalities, billions of taxpayer dollars have been spent adding electric buses to transit fleets across the United States to supposedly reduce carbon dioxide emissions. However, these electric buses are sitting unused (https://www.foxbusiness.com/politics/electric-buses-sitting-unused-cities-across-the-us) as they are broken-down and either cannot be fixed, are too expensive to fix, or have been scrapped altogether.

Officials in Asheville, North Carolina, recently expressed frustration (https://www.foxbusiness.com/politics/north-carolina-city-spent-millions-on-electric-buses-dont-run) that three of the five e-buses the city purchased for millions in 2018 are now sitting idle due to a combination of software issues, mechanical problems and an inability to obtain replacement parts. The Denver Gazette reported (https://www.foxbusiness.com/politics/electric-buses-sitting-unused-cities-across-the-us) that two of the four e-buses the Mountain Metropolitan Transit in Colorado Springs acquired in 2021 are not running. They cost $1.2 million each (https://www.foxbusiness.com/politics/electric-buses-sitting-unused-cities-across-the-us), mostly paid for by government grants. A major part of the problem is the manufacturer of the buses, the Biden Administration- backed Proterra, filed for Chapter 11 bankruptcy (https://www.foxbusiness.com/category/bankruptcy) in August. Founded in 2004, the company became the largest e-bus company in the United States, representing nearly 40 percent (https://www.foxbusiness.com/politics/electric-buses-sitting-unused-cities-across-the-us) of the market prior to filing for bankruptcy. Since the bankruptcy filing, it has been impossible to get parts. Department of Energy Secretary Granholm was one of their celebrity shareholders (https://www.cnn.com/2021/05/27/politics/jennifer-granholm-proterra-stock/index.html), while Vice President Harris was an outspoken advocate for EV (https://youtu.be/-K7sJs9IPjY?t=257) school buses.

However, cities had problems with the company's buses long before then. In 2020, The Philadelphia Tribune reported (https://www.foxbusiness.com/politics/electric-buses-sitting-unused-cities-across-the-us) SEPTA's entire $24 million fleet of 25 buses manufactured by Proterra had been pulled out of commission–the third-largest fleet of all-electric buses in the United States at the time. In September 2021, the Daily Bulletin (https://www.dailybulletin.com/2021/09/08/mechanical-problems-with-early-electric-buses-plague-multiple-transit-agencies/) out of California reported that "As of August, Foothill Transit, based in West Covina and serving the San Gabriel Valley, parts of Los Angeles and Pomona Valley, had 13 idled battery-electric buses out of 32 in its fleet. At one point, the agency indicated up to 67% of its electric buses were not operating during 2019 and 2020."

Other cities were also struggling with idled electric bus fleets. In November 2022, the entire fleet of Proterra electric buses in Louisville had not operated in two years for which the city had paid $9 million. (https://www.foxbusiness.com/politics/electric-buses-sitting-unused-cities-across-the-us) In Austin, Texas, the city's Capital Metro entered into a $46 million (https://www.foxbusiness.com/politics/electric-buses-sitting-unused-cities-across-the-us) deal with Proterra in 2020 for the company to build 40 e-buses. Capital Metro has six of them in operation

(https://www.foxbusiness.com/politics/electric-buses-sitting-unused-cities-across-the-us) while they await another 17 that have been built but are sitting in Proterra's South Carolina factory because chargers for them are not yet available. Broward County, Florida, purchased 42 e-buses from Proterra for $54 million (https://www.foxbusiness.com/politics/electric-buses-sitting-unused-cities-across-the-us), and the first batch operated for an average of 600 miles (https://www.foxbusiness.com/politics/electric-buses-sitting-unused-cities-across-the-us) before breaking down, while the second batch averaged 1,800. For comparison, the county's much less expensive diesel buses average 4,500 miles (https://www.foxbusiness.com/politics/electric-buses-sitting-unused-cities-across-the-us) between failures.

The Fiasco Goes On

The U.S. Environmental Protection Agency (EPA)'s Clean School Bus Program is spending $5 billion (https://www.michigan.gov/egle/newsroom/press-releases/2024/01/10/bipartisan-infrastructure-law#:~:text=Nearly%2017%2C000%20school%20buses%20transport,school%20districts%20across%20the%20state.) five years, 2022 to 2026, underwriting electric buses for schools that could not afford them otherwise. The funding requires low income and rural school districts, school districts in areas most affected by air pollution, and other environmental justice factors to be prioritized in allotting the funds. Priority districts are eligible (https://www.bridgemi.com/talent-education/rural-michigan-schools-are-considering-electric-school-buses-epa-cash) for funding up to the full cost of 25 buses and the necessary chargers. So far, the EPA has spent $1.84 billion (https://archive.is/551eE#selection-445.32-445.221) from the fund, on 5,103 electric buses. That averages out to more than *$360,000 per bus*—3 to 6 times more than diesel buses that cost between $65,000 and $100,000 (https://archive.is/551eE#selection-445.32-445.221) each.

Michigan Governor Gretchen Whitmer wants Michigan to build the infrastructure for 2 million electric vehicles by 2030 (https://www.michigancapitolconfidential.com/news/coming-to-michigan-in-2024-125m-of-electric-school-buses). Her plans to overhaul the state's 8,800-vehicle fleet (https://www.michigancapitolconfidential.com/news/coming-to-michigan-in-2024-125m-of-electric-school-buses), however, will not be complete until 2040—a decade later. Portions of Michigan's 17,000 school buses (https://www.michigancapitolconfidential.com/news/coming-to-michigan-in-2024-125m-of-electric-school-buses) will transition to electric ahead of the state government fleet. Michigan is getting $125 million (https://www.michigancapitolconfidential.com/news/coming-to-michigan-in-2024-125m-of-electric-school-buses) from EPA to help school districts buy electric school buses. That means Michigan's $125 million will buy less than 350 electric buses. To replace all 17,000 school buses in the state, it would take more than $6 billion, leaving school districts with expensive and frequent repairs.

Ann Arbor Public Schools was an early adopter of the electric school bus. Officials have admitted that the onboarding of just four electric school buses has been a struggle (https://freebeacon.com/biden-administration/biden-spent-1-billion-to-get-schools-electric-buses-this-michigan-district-says-theirs-hardly-work/) due to cost, downtime and performance issues. The e-buses cost five times (https://www.michigancapitolconfidential.com/news/coming-to-michigan-in-2024-125m-of-electric-school-buses) what a regular bus would cost, while the charging infrastructure was four times (https://www.michigancapitolconfidential.com/news/coming-to-michigan-in-2024-125m-of-electric-school-buses) more expensive than estimated. Besides the cost of the e-bus, there is another $1,200 to $12,000 or more for a basic EV charger (https://www.nycschoolbus.org/technical-school-bus-need-to-know-1#:~:text=Level%202%20chargers%20are%20required,electric%20system%20upgrades%20are%20necessary.) and infrastructure-related costs.

The EPA identified 297 "priority districts" (https://www.bridgemi.com/talent-education/rural-michigan-schools-are-considering-electric-school-buses-epa-cash) out of Michigan's over 800 (https://www.michigan.gov/mde/-/media/Project/Websites/mde/Year/2021/06/28/numbsch.pdf?rev=717211d256aa429eaaca4f65291eccaa&hash=EABFBEBA561E286B9750F4193AD3F26A) traditional and charter districts for the grant program, primarily in rural and low-income areas. Non-priority districts are also able to apply for funding, but would only receive $250,000 per bus and $13,000 per charger (https://www.bridgemi.com/talent-education/rural-michigan-schools-are-considering-electric-school-buses-epa-cash), which would make the school district's cost of a new electric bus comparable to the price of a diesel bus.

The Michigan school districts have concerns (https://www.bridgemi.com/talent-education/rural-michigan-schools-are-considering-electric-school-buses-epa-cash) about battery capacity, charging infrastructure, the state's brutal winters and ease of maintenance. Different models of electric school buses have a range of 70 to 200 miles (https://www.bridgemi.com/talent-education/rural-michigan-schools-are-considering-electric-school-buses-epa-cash) on a full battery, while diesel buses can go over 500 miles on a full tank (https://thomasbuiltbuses.com/resources/articles/determining-fuel-costs/#:~:text=While%20gasoline%20costs%20per%20gallon,same%20standard%2Dsized%20fuel%20tanks.). Unlike diesel-powered vehicles, the range for electric buses drops in the winter. Batteries reduce (https://www.bridgemi.com/talent-education/rural-michigan-schools-are-considering-electric-school-buses-epa-cash) their range in winter because some of their energy is used to heat up the cabin, a necessity where harsh winters are the norm. The range drops quite a bit when it is very cold so in a rural area one needs to be cautious when traveling long distances characteristic of rural areas. Charging several times a day can help deal with range matters but if the buses need to go to events where there are no charges, the situation becomes difficult and additional costs are required for reliable backup.

Conclusion

The Biden administration is pushing electric buses on cities and schools to further its climate agenda. However, there are problems with the program including initial cost of the e-buses, ability to get parts, and bankruptcy from one of the major manufacturers and suppliers, resulting in many e-buses sitting idle. The school bus program also has issues including cost of the e-bus, which can be 3 to 6 times more than a diesel bus; range, which is just 15 to 40 percent of a diesel bus's range; availability of charging stations; and weather degrading battery capacity, thereby reducing range. Nevertheless, Biden's EPA is handing out money and eligible school districts are accepting the funds and purchasing e-buses.

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Shocker: Reliability Issues Could Delay 200 New Zero-Emission Buses This Year

Reliability issues mean that electric buses aren't available for a full day of service like diesels are.

By **Dave Colon**

12:04 AM EDT on June 24, 2025

Governor's Office | The electric buses out there are unfortunately not doing well out there.

This relationship lacks a spark.

The MTA might have to delay accepting an order of 205 electric buses due to arrive in October if the manufacturer can't fix a number of reliability issues.

The 60 New Flyer electric buses that the MTA has already put into service are extremely unreliable because batteries overheat or fail to fully charge, according to a report handed to the MTA Board on Monday by an independent engineer who oversees capital projects. The engineer also noted that there are ongoing questions about whether the batteries can actually last for eight years as they're supposed to.

The reliability issues mean that the electric buses aren't as available for a full day of service as the agency's standard diesel buses, and also break down much more frequently.

Only 60 percent of battery-electric buses are typically available for a full day of service, compared to 91 percent for diesel buses. And the number of miles a bus can travel before needing major repairs on average is just 2,111 miles for electric buses — and 13,000 miles for standard diesel buses.

And it's not about the manufacturer; the diesel buses are also built by New Flyer.

MTA officials also noted that it isn't just the batteries that are failing on the buses.

"We get a lot of calls on the road [about] electrical components," said Daniel Cardoza, the chief maintenance officer at the MTA's bus division. "They're all electrified now, so the air brake systems work with an electric compressor and the electric compressors are failing on the road."

The MTA has committed to meeting the state's mandate to have a fully electric fleet by 2040, and has included plans to order 500 electric buses in the 2020-2024 capital plan and the 2025-2029 capital plan. The agency also needs to get the timing right to retire buses every 12 years, and if the electric buses are not ready to roll, it will need to press older buses into service past their usual lifespan.

This is because oversight engineer noted that if the MTA sticks to its policies of "not accepting buses until all technical and quality issues are resolved," it could mean the agency will not accept delivery of 205 buses due in October.

"You have got to have buses that aren't going to break down," MTA Chairman and CEO Janno Lieber said in perhaps the understatement of the year. "So you have to figure this out through the testing and commissioning process."

The MTA is hardly the only transit agency that is finding battery-electric buses may not be fully ready for primetime. But there's a limited pool of suppliers the MTA can choose from while it continues to put the New Flyer buses through in-service testing.

"The whole nation is moving in this direction and it's created a lot of pressure on the industry," said Lieber. "We're operating in a dynamic environment where the technology and manufacturing quality is going 100 miles per hour, and where manufacturing capacity and the number of manufacturers in the industry is not where it needs to be. But we're working with some known New York State manufacturers [such as New Flyer], so we're hoping they can sort this out."

9/11/2025

To whom it may concern,

Why Modern Motorcoaches Must Idle

Modern motorcoaches are engineered to rely on engine idling to power and operate critical onboard systems. Idling is necessary to build and maintain air pressure, which controls the air brakes, entrance doors, and baggage compartment doors. It is also essential for the operation of the wheelchair lift, the kneeling feature, and for maintaining the proper ride height of the vehicle.

Additionally, the HVAC system depends on engine idling to produce warm air in freezing conditions and cool air in high temperatures. Power steering functionality and battery charging also require the engine to be running. Without idling, these vital systems cannot function safely or effectively.

Therefore, idling is not merely a convenience—it is a necessity for the safe operation and full functionality of the motorcoach.

Regards,

ABC Companies

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Bus Association of New York State, Inc. & BUS4NYC Coalition, Inc.

Dear Commissioner Agarwalla, Dep. Commissioner Lubin and Chief of Staff Ponting:

As state and local bus associations here in New York State and New York City, our members have brought to our attention a substantial increase in their receipt of idling violations in New York City. The impact is also being felt well beyond our region by motorcoach operators in New England and the Mid-Atlantic, Southern and Midwestern states. Accordingly, we believe it incumbent upon us to bring this to your attention as the unintended consequences of this program are the detrimental impact on safety and the decision by many carriers to curtail visits to NYC. We also believe that the environmental goals of the idling program are not being achieved as presently enforced.

1. All buses, whether public or privately owned, reduce congestion by taking as many as 35-55 cars off the street. Modern motorcoaches are in all charter, intercity, commuter, shuttle and airport services, and they operate in support of rail and air as well. A recent study conducted by the ABA Foundation points out that travel by motorcoach is the most efficient, environmentally friendly, form of ground transportation. The ABA Foundation Study found that:
   Motorcoaches Emit the Least CO_2 Per Passenger-Mile.
   Transit Buses Emit 10x More CO_2 Than Motorcoaches.
   Motorcoaches Lead in Low Social Cost of CO_2 Emissions.
   Clean Idle Technology Sets the Standard for Emissions Compliance.
   Motorcoaches Are the Most Energy-Efficient Mode of Transportation.

   - *ABA Foundation Study (attached)*
   - *UMA Fact Sheet (attached)*

2. The Anti-Idling program has a direct negative impact on the safety of passengers, employees and the surrounding public. Motorcoaches carry people, not dry goods or packages. Buses are not trucks.

   - Motorcoaches have air-operated critical safety and operating systems. For example, unless sufficient air is built up to operate the braking system, it will not function properly. It is a safety hazard (and foremost in NYSDOT and CVSA Out-of-Service criteria) to operate the vehicle without sufficient air pressure. Additionally, the door(s), luggage bay locks and kneeling systems are all operated by air pressure. The only way that air pressure can be generated and maintained is by running the engine in a stationary position. This is prohibited under the current anti-idling rules. *NYSDOT and CVSA Out-of-Service criteria may be accessed here: https://cvsa.org/news/2025-oosc/ https://www.dot.ny.gov/divisions/operating/osss/bus-repository/F393DBD2A1C2039EE0530A6C8946039E*

BANY – 111 Washington Avenue, Suite 600, Albany, NY 12210 – (518)426-3233 – www.banybus.org
BUS4NYC – 1444 86th Street, Brooklyn, NY 11228 – (917) 836-3685 – www.bus4nyc.org

- Motorcoaches have a closed HVAC system that requires the vehicle to be running to circulate air throughout the cabin. The windows in a motorcoach do not open (except for emergency egress). It is a closed system that can only be refreshed through the forced circulation of air. Although most dramatic in weather extremes of hot and cold, the non-circulation of air can be very detrimental at more moderate temperatures, affecting the health and comfort of those aboard, including the driver. It is necessary for a motorcoach to have its engine running to power properly its HVAC system and this is prohibited under the current anti-idling rules when the vehicle is stationary.

- Modern motorcoaches require a process called Exhaust System Regeneration that is critical for their clean air systems to function. In some cases, this can only occur while the vehicle is stationary with the engine running at a fast idle. The process is computer controlled and outside the control of the driver. If the clean air system is not allowed to initiate and/or complete the regeneration process, the engine will shut down and the bus will not be operable. This regeneration process is prohibited under the current anti-idling rules.

- The EPA Model State Idling Law exempts many of these situations and calls for a 15-minute idling period for passenger buses. *See EPA Model State Idling Law, Sections E and F (attached)*

- We have attached a copy of an operators' manual for a 2016 MCI Motorcoach. This is typical of all motorcoach operators' manuals that discuss the above points from the manufacturer's point of view. *See MCI Operator's Manual (attached)*

3. The Anti-Idling Program as presently enforced does not adequately protect the environment. The administrative dismissal of violations by public transit buses allows the majority of buses plying NYC streets to ignore the idling rules. The MTA and NYCT are held to less restrictive engine emission environmental regulations than private operators.

    - https://www.nyc.gov/site/dep/environment/idling-citizens-air-complaint-program.page

4. The Citizen Air Complaint Program as enforced is ineffectual, burdensome and unfair to private bus operators. While the majority of buses operating on the streets of NYC are receiving administrative dismissals, private operators are receiving notices of alleged violations sometimes 6 to 12 months after the occurrence. Often these alleged violations are deficient on their face but require a costly legal defense.

    - The use of untrained citizens (with a financial stake in the outcome of summons issued) to enforce the anti-idling statute creates a potentially dangerous environment for motorcoach drivers, their passengers and the citizen complainant. Citizen complainants do not receive the training or instruction that law enforcement personnel receive; they have a financial stake in the outcome unlike traditional law enforcement personnel; and they are not subject to supervision or disciplinary action for wrongful behavior. One BANY member received 45 summonses in February 2025, 43 of which were dated from June 2024. One complaint was from December 2024, one from October 2024. Out of that group of summonses, 14 had videos that showed no idling violation. The egregious nature of these actions is evident when multiple alleged violations come from one complainant on a single day from one location.

5. Zero emission motorcoaches are not yet feasible. The unavailability of adequate re-charging and electrical generation infrastructure, excessive cost and other unforeseen impacts on city streets from the weight of these vehicles, make purchasing and operating them prohibitive at this early stage. NYS has already recognized that its 2027 mandate on zero emission school buses needs to be pushed out at least two more years, and the recent decision by NYC to forego electric plow trucks are just two examples of this fact.
6. Currently there are over 150 miles of bus lanes within New York City (with an additional 23 miles of high occupancy vehicle lanes on highways which also accommodate buses). Charter buses, along with other buses (including School and MTA buses), have unrestricted access to bus lanes during the hours they are in effect.
7. The recently released Motorcoach 2025 Sustainability and Innovation Report, confirms motorcoach travel as the most energy-efficient and environmentally responsible mode of passenger transportation in North America. The report provides a comprehensive look at environmental benefits of motorcoach travel and the sustainability efforts of motorcoach operators and manufacturers. The Report confirms in 2023 alone, motorcoach travel helped the U.S. avoid an estimated $2.7 billion in social costs tied to emissions. The motorcoach industry is proving every day that clean, connected travel is already here. (the Report is attached)

Our ask is that <u>all</u> private motorcoaches be treated the same as public buses and that any alleged violations be administratively dismissed on the grounds that the net effect of private buses operating is positive for the environment. They carry the same riding public as public transit; they are clean, green and efficient; and they remove many other vehicles from the streets. They are also unable to operate safely under the current rules. The CBDTP has exempted private buses from its congestion pricing scheme and this, we would argue, is directly analogous. Buses are part of the solution, not the problem.

Thank you for your consideration and the opportunity to voice our concerns.

Respectfully,

Glenn Every President,
BANY Tonche Transit

Robert Brisman
Chairperson, BANY
President, BUS4NYC
West Point Tours

Patrick Condren
Administrator, BUS4NYC
BANY Board of Director

cc: Michael Horak, Bus Industry Safety Council

Enc: EPA Model State Idling Law
UMA Fact Sheet
NYSDOT Out of Service and Defect Criteria MCI
J4500 Operator Manual
ABA Sustainability Study

Statement to NYC Council Committee on Environmental Protection
Re: Bill Intro 0291 2024
September 18 2024

BUS4NYC Coalition Inc. requests buses be NOT included in Bill Intr. 0291-2024 and be exempt from summons submitted under the Citizens Air Complaint Program..

- Publicly &Privately Owned buses serve the same Riding Public, known as public transport. This Common Good is for the benefit of People, Passengers, the Public.
- Passenger Transportation carries PEOPLE, not materials, food or truck items.
- Public or privately owned buses mitigate congestion, often creating cleaner air with new technology and greatly reduced emissions, providing public benefits.
- All Buses, Private and Government owned serve the same riding public passengers.
- Buses are part of the solution, not the problem. Privately owned buses represent a minor fraction of Motor Carriers regulated by USDOT, FMCSA and NYSDOT. Majority=Trucks.
- 55 passenger bus occupies less space than 55 cars, 55 bikes, or even 55 pedestrians.***55 Passenger Cars generate significantly more emissions than a bus.***
- Buses are not Trucks! Passenger Safety and Well Being is paramount. Shutting down engines can be dangerous, potentially lethal.
- Unlike other vehicles, such as refrigerated trucks, buses often need to maintain engine power to generate heat in the winter and a/c in the summer, for the health and safety of passengers. Loading and Unloading of 55 + People, or more ,often takes more than 3 minutes.. Senior Citizens, Students, Residents and Visitors are the People loading and unloading, notwithstanding engine running or not.
- Bus types include Local, Express, Commuter, Inter-City, Tour/Travel, Airport, Convention Shuttles and Special Operations. Sightseeing Buses may have 80 persons..
- Private Buses provide government emergency response for Military, Medical, Special Events, Weather-related shutdowns of Airports, Railroads, Schools and public needs.
- Air Quality is exacerbated by private autos and excessive truck deliveries to residents and workers ordering online. Not People using buses.

Glenn Every President, Patrick Condren Administrator BUS4NYC Coalition Inc. www.bus4nyc.org 917 836 3685

THE WALL STREET JOURNAL.

Delta Replaces Engine Units in Effort to Address Toxic-Fume Surge on Planes

Such incidents have led to brain injuries for crew and passengers, The Wall Street Journal reported recently

By
Benjamin Katz
Follow
Updated Sept. 25, 2025 8:10 am ET

A Delta Airbus A320 arriving in Los Angeles earlier this year. PHOTO: KEVIN CARTER/GETTY IMAGES

Delta Air Lines DAL -1.77%decrease; red down pointing triangle is replacing power units on more than 300 of its Airbus AIR -0.07%decrease; red down pointing triangle jets in an effort to stem cases in which toxic fumes have leaked into the air supply and led to health and safety risks for passengers and crew.
The move is one of the most aggressive efforts by a major U.S. airline to address what in recent years has increasingly become a hidden hazard of modern air travel.

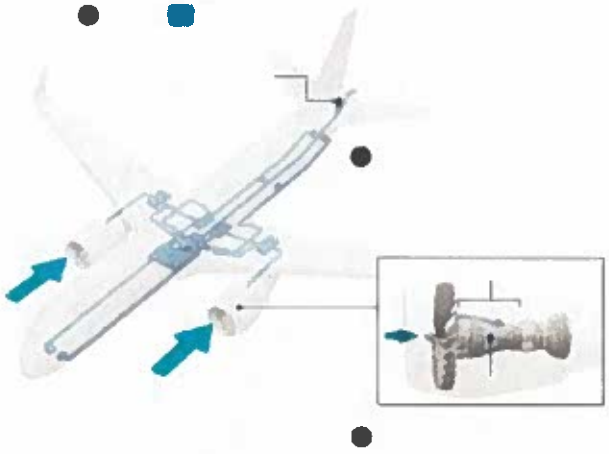
The airline is about 90% of its way through the process of upgrading the engines, a type known as the auxiliary power unit, on each of its Airbus A320 family jets, according to a spokesman for Delta. The airline operates 310 of the narrow-body type, including 76 of the latest generation models as of the end of June.

The APU is typically a third engine that sits in the tail of an aircraft and is used to generate electricity and pump air into the cockpit and cabin when the two primary engines aren't running, and for example often during taxiing. A leak in the APU can also contaminate the air even when it isn't in use, according to maintenance specialists and internal troubleshooting documents.

Airbus has previously identified the APU and how it is integrated on the A320 as a leading cause of toxic fumes contaminating the so-called bleed air system. A fume event typically occurs when oil leaks into the engine or power unit's compression chamber and is vaporized at extreme heats, releasing unknown quantities of neurotoxins and other chemicals into the cockpit and cabin air.

The Wall Street Journal reported earlier this month that fume events have been surging in recent years, driven in large part by incidents on the Airbus A320 family, and that they have led to brain injuries and other illnesses in both crew and passengers.

How a Plane's Cabin Air Can Be Contaminated



Outside is pulled in through the engine.

Auxiliary power unit (additional engine)

Oils from within the engine compressors can leak through degraded seals. When that happens, oil vaporizes in the heat, releasing toxic compounds.

Compression section
Seals
The contaminated air is piped into the body of the aircraft.

Note: Plane components aren't exact, and are for illustrative purposes.
Source: Airbus, Pratt & Whitney, Wizz Air

Delta hasn't previously disclosed the APU replacement program, which began in 2022.

Replacing the APU, which can become more prone to fume events with age, mitigates some of the risks from toxic leaks but doesn't address them entirely. Airbus last year found that most cases on the A320 were linked to leaks entering the APU via an air inlet on the aircraft's belly.

Another separate cause is leaks in the jet engines themselves, which provide most of the bleed-air supply when active.

Delta and other U.S. carriers have seen a surge of incidents across A320 family aircraft that has outpaced the number of reported fume events on other Airbus and Boeing aircraft, according to the Journal's analysis of reports to the Federal Aviation Administration.

Over the past year, APU-related fumes on Delta's A320 jets have led to emergency diversions and abandoned takeoffs, pilots donning oxygen masks and an instance of a passenger vomiting, the analysis showed.

It is difficult to assess whether some carriers have more of those incidents than others because not all fume events are flagged by crew, and airlines have different standards when reporting to the FAA.

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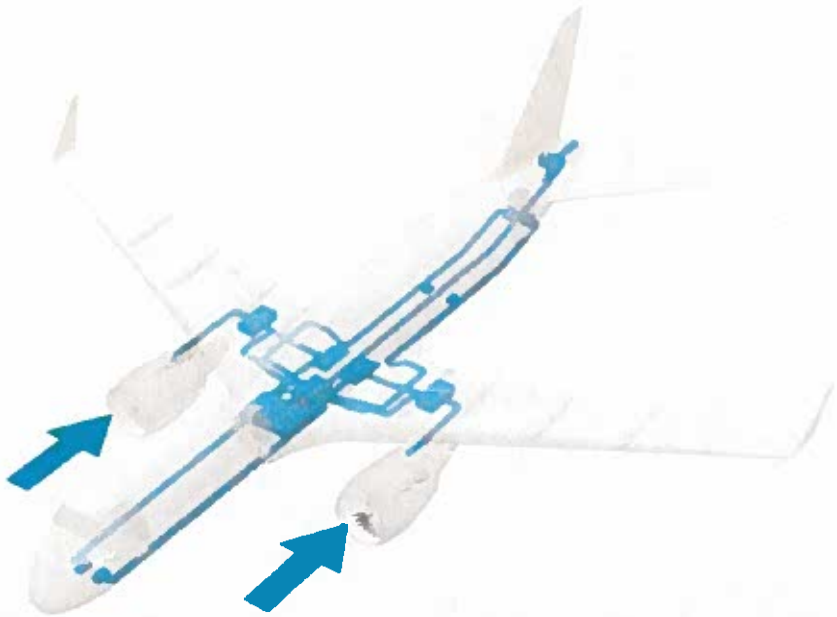

Toxic Fumes Are Leaking Into Airplanes, Sickening Crews and Passengers

A Delta spokesman said that though fume events are rare, the company treats each seriously, as it does for all safety matters. "Nothing is more important than the safety of our customers and people," he said.

An Airbus spokeswoman referred to a previous statement that the company was working with airlines and regulators to enhance its aircraft and ensure "the best possible cabin environment for passengers and crew." That statement also said: "Airbus aircraft are designed and manufactured according to all relevant and applicable airworthiness requirements."

Delta declined to comment on costs associated with the replacement program or to identify the manufacturers of APUs on its A320 fleet, but records filed to the FAA show that Delta operates models made by Honeywell and RTX's Pratt & Whitney.

Both Honeywell, which dominates the APU market, and Pratt & Whitney have had issues with models deployed on the A320 family for years, according to internal maintenance and company documents, engineering specialists and legal complaints. The issues have spanned defects with gearboxes and cooling fans, but predominantly affected seals meant to protect against oil lubricants leaking into the air supply.

Pratt & Whitney introduced three separate fixes in 2019 and 2020 for its APU model on the A320 family, according to an internal Airbus presentation, while Honeywell has

developed new upgrades to address defects including for the APU's load compressor seal.

The Honeywell fix—the company's third attempt to address problems with that seal since 2007—was announced late last year. In a marketing document at the time, the company listed as a primary benefit of the upgrade: "An improved passenger experience thanks to reduced possibility of odor in cabin events."

American Airlines has separately been upgrading its Honeywell APU load compressor seals across its A320 fleet since April 2023, a spokeswoman said.

A similar version of Honeywell's APU is also used on Boeing's 737 family of jets.

Honeywell and Pratt & Whitney declined to comment.

The increase in incidents follows changes to maintenance requirements that Airbus began approving from 2017, which allowed airlines to regularly send aircraft back into service after a fume event had occurred.

Two years after the change, Airbus and Honeywell issued a "good practices guide" to help airlines mitigate APU-driven fume events. That included extensive weekly visual inspections to the power unit and a suggestion that pilots wait three minutes after turning on the APU before activating the bleed air to give the APU seals time to adjust to the temperatures and start working properly.

The companies also suggested that airlines consider operating flights with the APU air supply turned off—removing air conditioning on the ground—if conducting maintenance might cause disruption to their flight schedules.

"Corrective maintenance action can be planned at a better opportunity," Airbus and Honeywell wrote in the March 2019 joint presentation. They also reminded airlines that the precautions for mitigating fume events were only an optional guide to help operators suffering from repetitive fume events.

Internal maintenance and other documents show that Airbus and Honeywell have been aware of fumes-related issues with load compressor seals in the APU for over two decades.

An internal Airbus email from 2019 showed staffers debating how best to address a request from American Airlines, which had asked for specific data on root causes of fume events. The Airbus team found an internal study conducted over 20 years ago that identified issues with that specific seal.

"Don't officially give them the report because it identifies the airline and aircraft etc, and mentions APU load compressor seal oil leakage (back in 2003 !!)," the Airbus staffer wrote, according to the email exchange reviewed by the Journal.

An airline internal maintenance document shows that Airbus was aware of the issue even sooner. The plane maker notified customers in November 2001 that one operator had experienced "significant oil fumes in the cabin" during a flight due to a worn load compressor seal in the Honeywell APU.

A lawsuit filed Sep. 3 on behalf of three former JetBlue flight attendants against the airline, Airbus and Honeywell cites incidents between 2022 and last year in which oil had leaked from Honeywell APUs and caused noxious fumes to enter the cabin. The suit alleges that the exposure led to lasting symptoms including heart palpitations, tremors and physical and cognitive impairment.

In one example from September 2022, fumes led to passengers complaining of nausea, a child suffering a nosebleed and four JetBlue flight attendants in the hospital. The suit alleges the same aircraft had been diverted two days earlier due to a passenger who was struggling to breathe.

The three companies that are defendants haven't yet replied to the lawsuit.

In a presentation to airlines last year, Airbus acknowledged that upgrades to seals and other faulty components within the APU would solve only a portion of reported fume events.

Airbus, as part of an internal program called Project Fresh, reviewed instances of fumes from 2016 to 2021 and found 12% related to oil leaks internal to the APU. The remainder were caused by the APU ingesting oil through its air inlet at the bottom of the aircraft. That includes leaks from overfilling of oil reservoirs, landing gear hydraulic fluid or de-icing liquids.

Airbus outlined three fixes, including the most radical, a design change that moved the position of the inlet to the top of the aircraft, and which Airbus said would reduce "smell" events by 85%.

That fix will only apply to new aircraft. For older aircraft, Airbus proposed other changes that it said are less effective.

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