



In Chicago, adapting electric buses to winter's challenges

By Tom Krisher

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CHICAGO (AP) — The No. 66 bus is packed on a recent weekday afternoon as it starts and stops its way from Chicago's near west side to Navy Pier along the Lake Michigan shore.

The seats and windows squeak and rattle just like a regular diesel bus, but no one seems to notice the high-pitched whine of the electric motor that makes it go.

That's just what Chicago Transit Authority wants. Buses that don't pollute the air yet can run the route with the same reliability as those that do, even when cold weather [cuts into the battery range](#).

Yet to make electric buses work, the CTA has had to go to great lengths and expense. It built fast-charging sites on both ends of the No. 66 route that plug into the bus rooftops.

Drivers constantly monitor the batteries to make sure they don't get depleted, risking the bus getting stranded. If they get below 50% charge, they're supposed to top them off at a charger.

"We're working through the day-to-day challenges of inclement weather in Chicago," said Don Hargrove, senior maintenance manager at the garage that's home to most of the authority's 23 electric buses.

The CTA started experimenting with electric buses in 2014, and has developed a system that Hargrove says will work as the transit authority moves to an all-electric fleet by 2040.

Other transit systems are going through the same process to help cut pollution and fight climate change.

Cold weather is the CTA's biggest problem. As the temperature drops, lithium-ion batteries that run the buses aren't as efficient and lose range. Most of the energy drained from the batteries goes to keep the bus interior heated to 70 F (21 C).

"Every time the bus stops to pick up passengers, let people off, the doors are opened," said Richard Lin, assistant chief bus equipment engineer. "You've got to heat that new batch of cold air."

The electric buses do have a small diesel engine that heats the interior in extreme temperatures to extend the battery range, Lin said. But most of the time the buses use electric coil heaters, similar to a giant toaster, which can zap batteries. When the CTA bought its buses, more efficient heat pumps weren't available as an option, he said.

On each 10-mile one-way trip on the No. 66 route, the electric buses lose about 8% of their battery energy. In the winter, they start with roughly 100 miles of range when fully charged. So after about six one-way trips, policy says drivers have to charge as they get below 50%.

Normally the schedule has 10 to 15 minutes built in for charging, and the buses get around 1% of a full charge for every minute they're plugged in.

With enough chargers, the electric buses can run all routes, Lin said. "It's just a matter of our strategy with placing the chargers at the correct locations, having enough chargers available as we scale up our fleet."

At present, the CTA has about 1,900 buses and most run on diesel fuel. The transit system is starting to swap them out for electric ones, but the investment is huge. Each electric bus costs about \$1.1 million, about \$500,000 more than a diesel model.

But after the initial capital outlay for the buses and charging stations, the electric buses are much less expensive to operate. The CTA calculates it costs \$2.01 per mile to run the 40-foot-long electric buses. For a diesel bus it's \$3.08, and \$2.63 per mile for a diesel-electric hybrid.

It would take decades for the authority to get its investment back in the electric buses, but CTA officials say the cost of electric buses will come down as more are sold.

In the capital of Alaska, Juneau, which has a more temperate climate but winter temperatures can still drop below zero, officials also have plans for an all-electric bus fleet, though one they got in 2020 has been plagued by mechanical problems.

Capital City Transit has ordered seven electric buses to replace diesel models from 2010, said Rich Ross, operations superintendent. The new buses are expected to run regular

routes due to increased battery capacity, “which wasn’t available when we ordered our first bus,” he said.

Cold winter conditions could still knock 100 miles off the expected 282-mile range of the new buses, so on the coldest days, they could be put on commuter routes that run only during the peak transit hours, Ross said.

Like Chicago, Capital City Transit is also planning to construct an “on route” charging station for buses to plug in if they run low.

Back on the No. 66 in Chicago, Dawn Carter, 54, says she’s glad electric buses are running the route because they’re good for the environment.

About the only difference is the electric buses are quieter than those with clattering diesel engines and noisy heaters, but few people notice, she says. “When I’m coming to work, everybody ‘s just rushing to get on and off,” she says. “It’s just quieter. It’s easier to talk to people. When the heat goes on and off you barely notice it.”

AP reporter Becky Bohrer in Juneau, Alaska, and Video Journalist Teresa Crawford in Chicago contributed to this story.

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