

A Green Future for Public Transit

Electric Buses for Regional Transit Service (RTS)



As of Fall 2022, RTS electric buses have reduced CO2 emissions by 838.1 metric tons and diesel fuel consumption by 82,327 gals.



PROJECT DESCRIPTION

- **Phased acquisition of 20 electric buses**
- **Charging Infrastructure**

PARTNERS & VENDORS

New Flyer

Electric bus vendor

Black & Veatch

Charging and electrical infrastructure design

Billitier Electric, Inc

Electrical construction

EV Connect and BTCPower

Charging hardware and management services

NYSERDA

Truck Voucher Program administrator

CALSTART

Truck Voucher Program support

CTE

On-route feasibility study vendor

New York Power Authority

Construction services and funding

Department of Environment Conservation

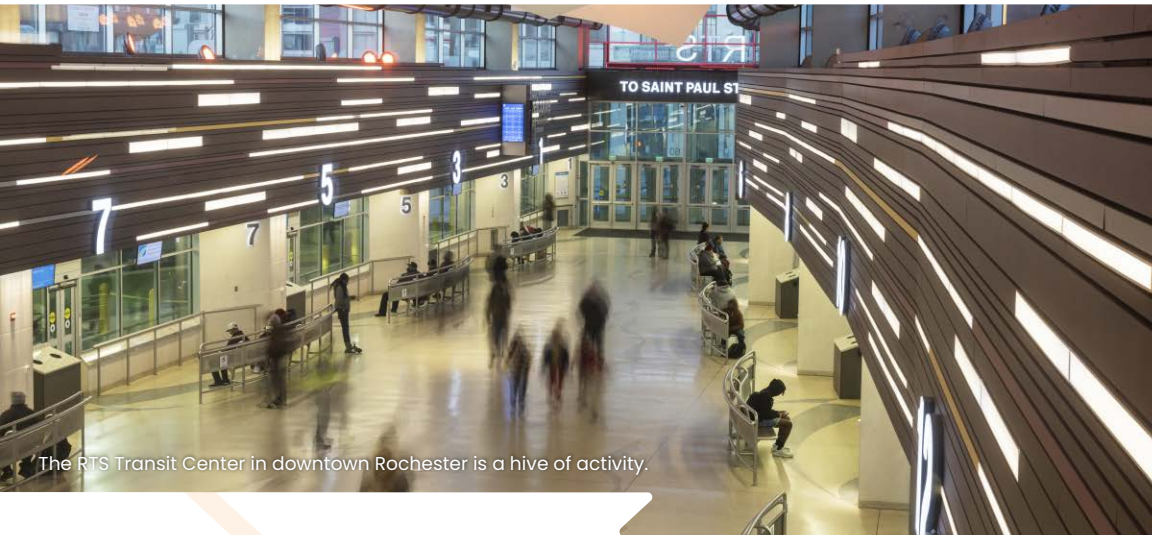
Helped administer agency VW settlement agreements

Department of Transportation

Supported the development of agency battery-electric master plans

NYS Policy Drives Change

In the 2020 State of the State address, unprecedented emission reduction targets within the New York State public transportation sector were announced, including 100% zero-emission bus fleets by 2035 for select transit systems. The ultimate goal? To help New York reduce greenhouse gases 85 percent by 2050, and to reduce air pollution and its impacts on public health, particularly in disadvantaged communities. Electric buses stand to benefit those who use public transportation the most, like our youth, older adults, and those without access to a car.



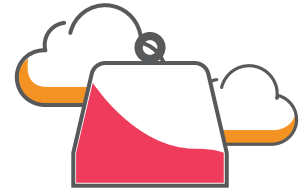
The RTS Transit Center in downtown Rochester is a hive of activity.

For RTS to meet NYS targets with their full-size buses, 2023 would be the last year to purchase new diesel buses. In this case study, RTS shares project details and lessons learned on their journey towards a clean transportation future.

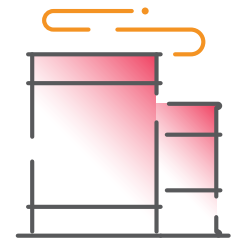
The Benefits of Battery-Electric Buses

- Reduced greenhouse gas emissions help combat climate change.
- Zero tailpipe emissions mean clean air for passengers, bystanders and local residents. Diesel exhaust is a known carcinogen and can also cause respiratory diseases such as asthma.
- They are about 5x more efficient than diesel.
- The power-train has far fewer moving parts than conventional buses with lower expected maintenance costs. Say goodbye to oil changes or oil filter replacements.
- Funding is available now to offset some upfront costs

Project Highlights:



838 Metric tons of CO₂ emissions reduced



82,327 Gallons of diesel fuel reduced

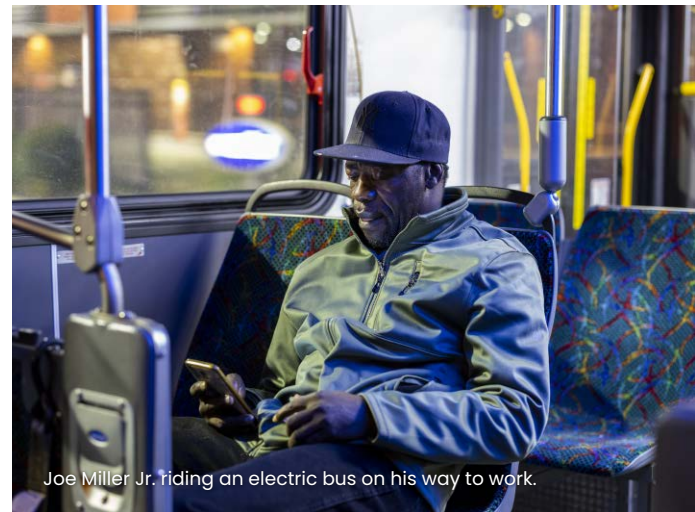
Peaceful Rides for Passengers

While passengers' awareness of the electric buses is inconsistent, their perceptions of electric buses are positive. We spoke to RTS Customer Joe Miller Jr. on his regular early morning route to work in property management. When asked if he knew he was riding an electric bus with no gas in the tank, just a battery that charges like your phone, he looked around quizzically, "No... I didn't know that. I definitely know some buses are quieter or louder than others."

A 15 year-old passenger on her way to West Irondequoit High School said, "If I get off, I'll see exhaust coming out [from the diesel buses], but not the electric bus. I like when there's clean air, no pollution."

Billy Davis works for the Open Door Mission, and takes the bus every day. "I prefer taking the bus," he says, citing how expensive it would be to own a car. Reflecting on the e-buses he says, "There's not an industrial sound. The vibe is real comfortable."

RTS Customers appreciate that the electric buses are quieter, provide cleaner air, and value e-buses' role in the fight against climate change.



Joe Miller Jr. riding an electric bus on his way to work.

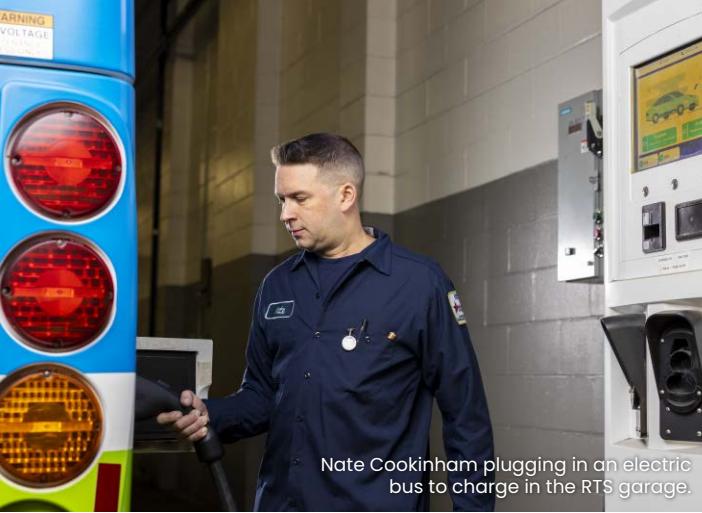
Smooth Driving for Operators

Marshall Jones is a life-long resident of the City of Rochester and has been a Bus Operator with RTS since 2002. He's seen some changes over those years, and the introduction of electric buses is just one of them.

Marshall either drives a diesel-powered bus or an electric bus depending on the day, but says the electric buses are his favorite. He describes them as, "Nice and smooth. No shaking. When you stop at a red light you can barely tell it's on. The passengers notice." When we asked Marshall about electric buses' reputation for sluggishness compared to their diesel counterparts, he shook his head. "I haven't had a problem with that. It picks up pretty fast."

Fresh Challenges for Mechanics

When it comes to servicing the new line of battery-electric buses, William "Rusty" Korth, VP of Zero-Emission Strategies, says the learning curve has been steep. After two years of operation with the first ten buses, the mechanical team has ironed out many of the kinks, but in some ways the technology still feels new. Software and hardware issues, long lead times for parts, and labor requirements continue to provide challenges to the electric fleet.



Nate Cookinham has always been someone who enjoys learning about new technology. As one of the first cohort of RTS technicians cross-trained on the electric models, Nate is candid about the challenges of working on the electric buses, but sees the value of getting experience in evolving technology.

Doing the Math on Electric Buses

Electric buses have a higher upfront cost than diesel buses – \$900k compared to \$550k – but the total cost of ownership is expected to be lower due to operating efficiency, the lower cost of electricity, and lower maintenance costs. RTS was proactive and creative when looking for funding sources that could turn their sustainability goals into a reality.

Funding Sources:

- **NYSDERDA Truck Voucher Program** – Covered most of the incremental costs of the battery-electric bus compared to a diesel bus at a rate of around \$360k per bus for 5 of the first phase of buses, and \$385k per bus for all 10 of the second phase of buses.
- **Low or No Emission Vehicle Program** – \$1MM in funds used for phase 1 bus and infrastructure purchases.
- **CMAQ Program** – \$5MM in funds used for phase 1 bus and infrastructure purchases.
- **RG&E Make Ready Funds** – \$1.1 MM in funds used for a new transformer and electrical gear upgrades to support the second phase.
- **NY Power Authority** – \$2MM used to fund a majority of the hardware and inside construction costs for 14 of the 20 dispensers and associated chargers.

“ One time I was driving with my son, and I saw ‘Electric Bus’ on the bus in front of me. Then it occurred to me—it’s pretty refreshing to not have exhaust fumes blowing in our faces.”

RUSTY KORTH

VP of Zero-Emission Strategies

A Leader in Clean Transportation

The Genesee–Finger Lakes region benefits from an electric grid that is almost entirely fossil fuel free, and a public transit system — RTS — that has heavily invested in clean transportation. Here are some of the lessons RTS has learned in its transition away from diesel.

Lessons Learned:

- **Pair the e-buses with the right route in terms of grade and duration.** Diesel buses have more torque and can maintain higher speeds on steep uphill climbs.
- **Don't underestimate cold weather.** Expect a significant reduction in e-bus range during cold weather.
- **Plan for learning time and labor.** New technology means more diagnostic and downtime.
- **Consider overhead charging.** The benefits of using an overhead pantograph system include saving space in a crowded garage, and fully remote charging.
- **Plan ahead to leverage funding and routine replacement schedules.** RTS replaces 10–25 buses every year as they reach the end of their life-cycle, so they were able to replace diesel buses as part of the normal fleet replacement plan.
- **Understand the costs of infrastructure.** Charging dispensers may require expensive upgrades to transformers and other on-campus infrastructure that current financial incentives don't fully cover.
- **School districts can learn from transit.** School bus schedules, with set routes in the morning and afternoon, may be able to charge midday without interrupting service if charging infrastructure is planned accordingly.
- **Time is your friend.** The RTS team's biggest words of wisdom? The transition to zero emission vehicles will not happen quickly. Start planning now, to make the transition as smooth as possible.

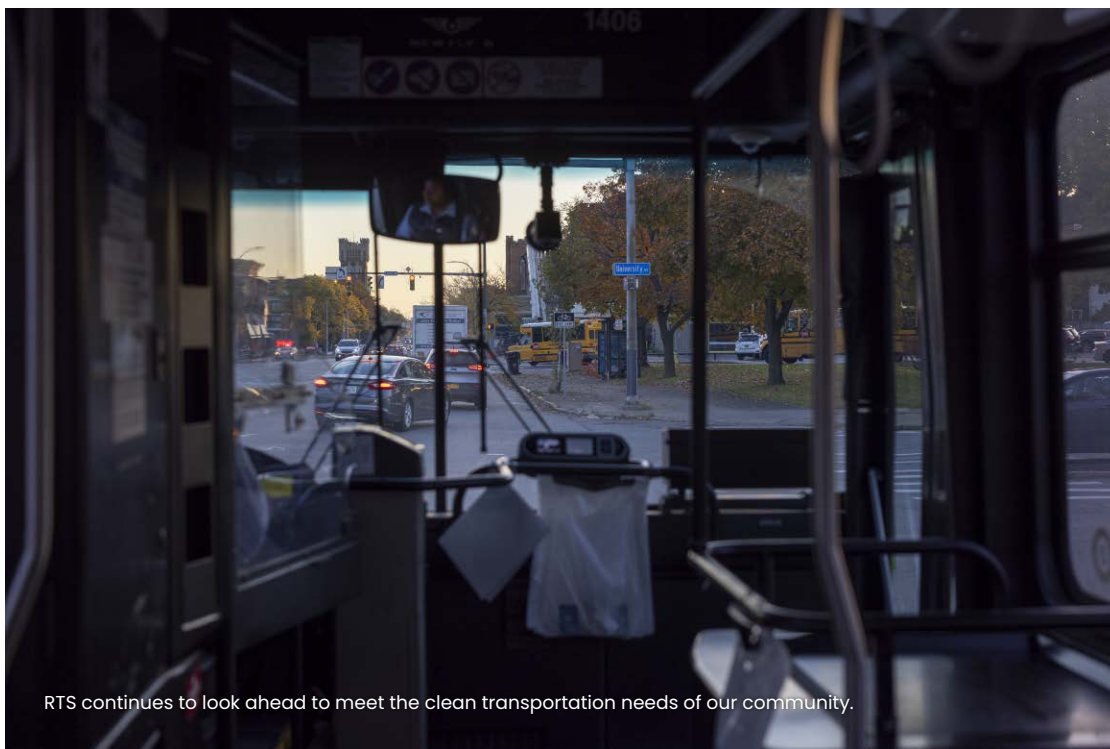


Marshall Jones has been operating buses for twenty years. The electric buses are his favorite.

What's Next for RTS?

Sustainability is part of RTS' core values, and they see their care for the environment reflected in consumer demand. Tom Brede, Public Information Officer, has seen the community become more environmentally conscious every year. In order to meet their zero emissions goals, RTS will move forward with a mix of battery-electric and hydrogen fuel cell buses.

Tom says that RTS has shifted from thinking of its role as providing "transportation," to supporting true "mobility." He says, "We try to take a first-and-last-mile approach – thinking about how people get to their stop, and that last leg to their final destination." In pursuit of this goal, RTS is a partner on the community's bike- and scooter-sharing program, and Rochester's new EV car-share program FloShare. RTS believes this combination of technologies is essential to creating an integrated clean transportation network for our community.



RTS continues to look ahead to meet the clean transportation needs of our community.

Get the tools, resources, and information you need to electrify your building at [AMPEDProject.com](https://www.ampedproject.com).

