

New York State Electric School Bus Policy Changes

Stay ahead of new 2023 state provisions that impact your school bus fleet.

Zero-Emission Mandates

New York's mandates require zero-emission school bus upgrades within the next 13 years: acting now gives you a head start and enables electrification at a pace that works for you.



100% of *new* school bus sales must be zero-emission



100% of school bus fleets must be zero-emission



Get Started Now

Build experience & electrify at a pace you can manage



Wait Until 2027

Manage the logistics of major fleet transition all at once



12-year Lease Terms

Leases for zero-emission school buses were previously limited to terms of up to 5 years. Now, zero-emission school bus leases may extend for up to 12 years. Longer duration lease agreements allow for electric school bus fleets at prices competitive with diesel today.

Lease Term Extensions

12 year leases make electrification affordable and allow for partners like Highland to simplify the process



Incentives

\$500m

Electric school bus fleet subsidies

Portion of New York's proposed \$4.2 billion environmental bond act*

*Pending ballot approval November 2022

\$220k

New York Truck Voucher Incentive Program (NYTVIP)

Vouchers to fleets across New York State that purchase or lease zero-emission school buses - limited and valued at up to \$220,000.

50%

Existing Alternative Fueling Infrastructure Tax Credit

50% of the cost, up to \$5,000 per charger, through 2022



How Can Highland Help?

Simple, Affordable Electric Upgrades

Whether you want to electrify a couple buses or your entire fleet, we manage the process for you from start to finish. We guarantee fully charged electric buses every school day for a fixed annual fee that is equal to or less than your current diesel costs.

Transition Over Time

Highland's products are customizable to match the needs and existing turnover of your owned or leased fleets, so you can upgrade to electric at a pace that works for you.

How Highland Works



Why Act Now?

Federal & State Funding

- The EPA Clean School Bus Program represents the largest amount of funding for zero-emission school buses in U.S. history. Near-term projects can apply to take advantage of the program before funding runs out.
- The Alternative Fueling Infrastructure Tax Credit is set to expire at the end of 2022. Unless the credit is renewed, funds will no longer be available.

A Smooth Transition

Project planning and implementation take time. Help your fleet operators by building in a buffer period to gain experience and phase in electric buses before the 2027 zero-emission bus mandate.

Budget Certainty

With rising costs and inflation, locking in fixed long-term transportation contracts eliminates price volatility and budget guesswork.

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Electric Fleets Community Benefits



Why Electric School Buses?



Healthy Students

Emissions-free vehicles mean better air for students, drivers, and communities.



Reliable Vehicles

Simple and reliable electric motors reduce maintenance costs.



Stable Budgets

Charging with electricity insulates community budgets from volatile diesel prices.

1. Community Health

Emissions-free vehicles eliminate toxic diesel fumes from school yards and neighborhoods.

NO_x 550 lbs

Exposure to diesel fumes is linked to childhood asthma and other health problems.

2. Environmental Justice

Electric school buses improve air quality for traditionally poor and underserved communities.

Black and Latinx Californians breathe 40% more particulate matter than white Californians.

3. School Budgets

Restore balance to your transportation budget with predictable energy pricing.

+66%
Diesel Prices Mar. 2021–Mar. 2022

Diesel price volatility wreaks havoc on student transportation budgets.

4. Driver Satisfaction

Recruit and retain drivers with quiet, easy-to-drive vehicles.

Students are better behaved when they don't have to shout over the engine.

5. Climate

Upgrading your fleet to electric reduces greenhouse gas emissions.

CO₂ 240 tons

Electrifying a school bus saves as much CO₂ over its lifetime as four passenger vehicles.

6. Academic Success

When your students breathe cleaner air, they miss less school and perform better.

- Increase Test Scores
- Reduce Absenteeism

Reducing student's exposure to air pollution is more cost-effective at raising test scores than reducing class size.

7. Emergency Resilience

As Distributed Energy Resources (DERs)—batteries on wheels—electric school buses can power your community in an emergency.

8. Grid Modernization

With vehicle-to-grid technology (V2G), electric school buses are helping build America's new energy grid, buffering peak demand and providing storage capacity for renewable energy.

Your town's electric fleet is an active member in your community—providing green energy storage, and emergency power when you need it most.



Want to learn more?
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① <https://projects.iq.harvard.edu/covid-pm>
 ② <https://uspig.org/reports/usp/electric-buses-clean-transportation-healthier-neighborhoods-and-cleaner-air>
 ③ https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMD_EPD2DXLO_PTE_NUS_DPG&f=W
 ④ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3351840



100mi

120-150

Mile range on a full charge



~3 hrs

to fully charge



98%

Battery capacity maintained after 5 years



97%

Fewer moving parts compared to a diesel engine



550

lbs reduction in NO_x per bus



240

tons reduction in CO₂ per bus

Buses

① What is an electric school bus?

An electric school bus is simply a school bus with an electric motor powered by a large bank of batteries. Electric school buses are built on the same chassis as internal-combustion buses, and by many of the same manufacturers, including Bluebird, Thomas Built, and IC.

② Is an electric bus structurally any different than a traditional bus?

No. Electric school buses are structurally identical to their traditional counterparts and meet all Federal Motor Vehicle Safety Standards (FMVSS) and Canadian Motor Vehicle Safety Standards (CMVSS).

③ What are the health benefits of electric school buses?

Electric school buses eliminate students' exposure to diesel fumes, which have been linked to childhood asthma, respiratory illnesses, as well as absenteeism. These effects are often more severe in historically poor and underrepresented communities.

④ Who supports electrifying school bus fleets?

A growing number of grassroots organizations support school bus electrification, including: Mothers Out Front, Moms Clean Air Force, 350.org community action groups, Climate Mayors, DOE Clean Cities Coalitions, and engaged members of your local school board.

Cost

① How much do electric school buses cost?

Electric Fleet Subscriptions, like leases, distribute that cost over a contract term—usually 10-15 years. Combined with other cost-saving measures, this helps create affordability and budget-neutral electrification plans.

② How much does it cost to install charging equipment?

Depending on equipment specified and project scope, upfront charging equipment costs can range from a few thousand dollars to hundreds of thousands of dollars—or more. In addition, many districts find that construction and installation can have significant hidden costs that negatively impact budgets and deadlines. Electric Fleet Subscriptions include all equipment and installation costs, mitigating client risk.

③ How complex is it to build an electric fleet?

Building an electric fleet's infrastructure and technology is a big project, including project planning, engineering, construction, utility interconnection & permitting, managed charging, demand response, vehicle to grid (V2G)—and more. Electric Fleet Subscriptions package all these elements into a turnkey solution with a fixed annual cost.

④ If electric buses are getting cheaper and better, why should my community electrify now?

The best reason to upgrade your fleet now is to enable your community to enjoy the benefits of clean, reliable electric buses today. Additionally, districts that start now have the opportunity to thoughtfully plan their transition and a slate of shovel-ready projects that are often prioritized by today's federal and state incentives.



Want to learn more?

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Batteries

① How far can a fully-charged bus travel?

Depending on the model, a typical electric school bus can travel 100-120 miles on a full charge. Electric school buses have a regenerative braking mode which enables them to partially recharge while they're being driven, and extend range.

② How long does it take to charge an electric bus?

With high-voltage conduit and DC fast chargers, an electric bus can fully charge in about three hours. Because plugging in an electric bus only takes a moment—and an entire fleet can charge at once—drivers and mechanics save valuable time compared to fueling up with diesel.

③ What's the lifespan of electric school bus batteries?

Electric school bus batteries last 10-15 years on average, with only 2% degradation after five years. At the end of their useful lifespan in electric vehicles, they can be reused in industrial applications; after that 90% of a battery's components can be recycled.

④ How do AC and heat affect bus range?

Electric AC and heat do reduce range, typically by 15% and 25%, respectively. If desired, optional fossil-fuel-powered heaters are available from some manufacturers which don't degrade range. Since the average bus route is 35-40 miles, proper route planning makes such reductions inconsequential.

⑤ What is vehicle-to-grid technology?

Vehicle-to-grid technology (V2G) allows an electric school bus to both draw energy from the grid (when charging) and discharge energy back to the grid (when fully charged). This bi-directional charging infrastructure transforms an electric school bus into a valuable Distributed Energy Resource (DER)—effectively a big battery that utilities can draw on to cover peak demand. Utility companies pay V2G fleets for this storage, which can reduce the cost of electrification.

Maintenance

① How do electric bus maintenance costs compare to diesel?

Electric school bus drivetrains have less than 3% of the moving parts compared to a traditional internal combustion engine. This translates to a lower total cost of ownership through maintenance cost savings. Typical savings are in the range of 30-50%.

② What is the warranty for the battery and electric drive motor? Is an extended warranty available?

Typical industry warranties cover eight years for the battery and drive motor with options to purchase extended warranties.

Performance

① Will my bus perform in the snow and extreme heat?

Electric motors & batteries are designed to be efficient in cold & heat - meaning more consistent performance across weather conditions..

② What happens if there's a grid outage?

Electric buses can maintain a full charge for weeks when parked - longer than most outages. In the event of an extended outage, Highland can bring temporary power generation to a site to support bus operations.

