



## 6 Factors Accelerating the Adoption of Electric Bus Fleets in U.S. Cities

In areas across Asia and Europe, the rate of electric vehicle (EV) adoption has considerably outpaced that of the U.S., with China being home to 99% of all the electric buses in the world.<sup>1</sup> But that lead should narrow soon, considering the following EV industry trends, economic factors and benefits expected to help make electric transit buses a more common sight in U.S. cities in the near future.

### 1. More Original Equipment Manufacturers, Increasing Electric Bus Availability

Despite some pandemic-related supply chain interruptions, the number of domestic electric vehicle OEMs is growing, and they are collectively on track to drive EV availability and affordability.<sup>2</sup> Several electric transit bus manufacturers are actively expanding their portfolios and accepting new orders.<sup>3</sup>

Moreover, several manufacturers are expected to enter the market in the next several years, set to offer electric bus models for both transit and school bus applications. For example, Proterra, the current leading provider of electric buses in the U.S., is continually growing its portfolio. The U.K.-based startup Arrival is building a South Carolina “microfactory” to focus on electric bus production.<sup>4</sup> Quebec-based Lion Electric has set up its California headquarters and the first deliveries of its long-range LionC model are expected to start in spring 2021.<sup>5</sup>

<sup>1</sup> <https://about.bnef.com/electric-vehicle-outlook/>

<sup>2</sup> <https://www2.deloitte.com/us/en/insights/focus/future-of-mobility/electric-vehicle-trends-2030.html>

<sup>3</sup> <https://www.globenewswire.com/news-release/2020/11/19/2130343/0/en/North-America-Electric-Bus-Market-Growth-Trends-and-Forecast-2020-2025.html#:~:text=There%20are%20presently%20close%20to,operators%20to%20acquire%20new%20units.>

<sup>4</sup> <https://arrival.com/news/arrival-to-build-its-first-us-electric-vehicle-microfactory-in-york-county-south-carolina>

<sup>5</sup> <https://electrek.co/2021/02/25/lion-electric-to-bring-zero-emission-school-buses-to-californias-largest-district/>

## 2. Favorable Political Climates

Federal, state and local EV incentives in the form of tax subsidies, grants and sustainability mandates are active across the U.S. However, the nature and extent of such support vary widely, with states on the east and west coasts offering the most extensive policy support for EV adoption.

Beyond regional disparity, it is clear that the Biden Administration intends to use transportation electrification as a major tool in its efforts to address climate change. Significant federal support is expected over the next several years, including for the transition of the federal fleet to electric. The administration recently issued an executive order directing “federal agencies to procure carbon pollution-free electricity and clean, zero-emission vehicles to create good-paying, union jobs and stimulate clean energy industries,” in a move that many believe will accelerate EV adoption by both the public and private sectors.<sup>6</sup>

## 3. Environmental & Public Health Benefits of Electric Buses

Transitioning transit and school buses from diesel to electric leads to a reduction in noise and exhaust emissions, leading to fewer particulates as well as greenhouse gases (GHGs) such as carbon dioxide in the air of the communities they serve.

Multiple studies have shown that air pollution and diesel exhaust cause respiratory diseases and exacerbate existing conditions like asthma, especially in children. As USPIRG reports, transit and school bus routes run continuously in high-population areas close to schools and homes. This positions bus electrification to be a high-impact strategy for improving public health and reducing health care costs.<sup>7</sup>

Quantifying GHGs of electric fleets requires taking into account emissions from vehicle operation as well as emissions associated with power generation. The level of decarbonization possible through electrification therefore varies according to the carbon intensity of the electrons used to charge the vehicles. Some advocacy groups have found that “battery electric buses have lower global warming emissions than diesel and natural gas buses everywhere in the country,” even in areas with carbon-intensive grids.<sup>8</sup> These emissions reductions benefits are highest in areas with greener electric grids, and as grids continue to reduce reliance on fossil fuel generation, fleet electrification will lead to even more significant reductions in GHG emissions.

## 4. Fuel and Maintenance Savings

Electric buses have higher upfront costs than diesel buses, but they can offer lower total cost of ownership over time. Scaled EV production will continue to drive down the upfront price difference between electric and diesel vehicles, and unsubsidized upfront price parity is projected by 2030.<sup>9</sup>

Electric buses trend cheaper to fuel, have fewer parts than fossil-fueled buses, do not require oil changes, and their brake systems and other components last longer. Long-term maintenance costs are forecast to be materially lower for fleet EVs, and it appears the overall EV service life may significantly exceed that of diesel vehicles, further improving long-term economics for the EV option.

Some cities have already found that EV-associated cost savings make up for higher initial investments. The Chicago Transit Authority found that using just two electric buses has saved the city more than \$54,000 annually in fuel and maintenance costs.<sup>10</sup> Seneca, S.C., was the first city in the world to launch an all-electric bus fleet; its buses prove more cost-effective than diesel and exceed expectations for operations and rider experience. In King County, Wash., the metro transit agency found that even though high electricity demand charges contributed to higher per-mile fuel costs, the return on investment was still favorable.<sup>11</sup> It is worth noting that advancements in energy management technology can also make it possible for fleet operators to respond to grid events, thereby reducing or eliminating demand-related charges.

<sup>6</sup> <https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/27/fact-sheet-president-biden-takes-executive-actions-to-tackle-the-climate-crisis-at-home-and-abroad-create-jobs-and-restore-scientific-integrity-across-federal-government/>

<sup>7</sup> [https://uspirg.org/sites/pirg/files/reports/ElectricBusesInAmerica/US\\_Electric\\_bus\\_scrn.pdf](https://uspirg.org/sites/pirg/files/reports/ElectricBusesInAmerica/US_Electric_bus_scrn.pdf)

<sup>8</sup> <https://blog.ucsusa.org/jimmy-odea/electric-vs-diesel-vs-natural-gas-which-bus-is-best-for-the-climate>

<sup>9</sup> <https://about.bnef.com/electric-vehicle-outlook/?sf122680186=1>

<sup>10</sup> <https://insideclimatenews.org/news/14112019/electric-bus-cost-savings-health-fuel-charging>

<sup>11</sup> [https://uspirg.org/sites/pirg/files/reports/ElectricBusesInAmerica/US\\_Electric\\_bus\\_scrn.pdf](https://uspirg.org/sites/pirg/files/reports/ElectricBusesInAmerica/US_Electric_bus_scrn.pdf)

## 5. Improved Electric Bus Charging Infrastructure

Continued EV technology advancements allow electric fleets to operate in similar ways as conventional diesel fleets, which should help remove barriers to realizing all-electric fleets at scale and facilitate a smoother transition.

The earliest electric buses deployed were capable of fewer miles between charges, with small on-board batteries that needed to be charged en route. Now, improved depot charging infrastructure and higher capacity batteries give electric buses enough range to run similar routes without interruption and return to the depot for overnight charging.<sup>12</sup>

## 6. Fleet Electrification-as-a-Service

Cities considering electric bus fleets can learn from early adopters. Early tests yielded positive results but shed light on issues that impact cost, reliability and overall success, such as weather, electricity price volatility, driving differences, battery management and charging.

For example, the intense heat in Albuquerque, N.M., sapped battery life, durability and safety, leading to underwhelming results in its 2018 bus testing. Thankfully, the city's bus contract included financial protections in the event of failure, so it returned its original electric buses without penalty and is now pursuing fleet electrification using updated battery technology.<sup>13</sup>

Buying buses is just one part of the equation. The process extends across multiple parties and areas where most cities and fleet operators have no prior experience, such as:

- Charging infrastructure and placement
- Route planning for limited or changing battery ranges
- Best practices in maintenance for non-internal combustion vehicles
- Managing electricity costs and reliability
- The logistics of scaling up a pilot program
- Integrating sustainability and resiliency considerations in overall infrastructure design

To help navigate this process, there is growing interest in what is known as Fleet Electrification-as-a-Service. These offerings aim to provide turnkey electrification solutions that help cities and fleets to avoid pricey mistakes and meet emissions targets faster.

As more and more cities become legally required to meet zero-emissions mandates, this type of experience could mean the difference between a smooth transition or an unsuccessful one. And as in Albuquerque's case, some offer agreements that can protect the city or fleet operator from undue risk.

## eTransEnergy: Comprehensive Fleet Electrification Services

eTransEnergy, a Duke Energy company, provides scalable fleet transition solutions to schools, municipalities, transit agencies and the logistics sector.

Our tailored comprehensive services include vehicle procurement, infrastructure creation, energy supply optimization, and ongoing support and maintenance, including integrated sustainability and resiliency solutions. Financing options are available to help minimize or even eliminate upfront capital expenditures and reduce overall financial risk, effectively allowing operators to outsource implementation of the entire fleet transition process.

[Contact us](#) to learn how we can help accelerate your electric fleet transition, so you can see the financial, environmental and health benefits of electric buses in your community.

<sup>12</sup> [https://www.reportlinker.com/p05760343/U-S-Electric-Bus-Market.html?utm\\_source=GNW](https://www.reportlinker.com/p05760343/U-S-Electric-Bus-Market.html?utm_source=GNW)

<sup>13</sup> <https://calpirg.org/reports/caf/electric-buses-america>

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