

Electric Vehicles in Rural Communities

Moving beyond the urban setting to advance
transportation electrification



Electrification
Coalition

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Introduction

The adoption of electric vehicles (EVs) and development of EV charging infrastructure has been accelerating at a remarkable pace in recent years as communities across the country seek to take advantage of the many benefits of this new transportation technology. Consumers, businesses, vehicle manufacturers, fleets, utilities, public health advocates, policymakers, and other stakeholders are working together to bring about a new era in transportation that supports economic growth, improves our national security, reduces harmful emissions, and strengthens energy security.

So far, much of the progress in this transformation has taken place in densely populated urban centers, whose high concentrations of resources and people made them practical proving grounds during the early stages of EV deployment and adoption. But rural communities also have much to gain from an electrified transportation system, and recent improvements in battery technology and market offerings make these vehicles better suited now to the needs of rural drivers and fleets than they were just a couple of years ago.

Unprecedented levels of funding are coming available from federal agencies and state governments to support communities in their

efforts to electrify transportation, with substantial sums set aside for rural communities. More than \$1.25 billion in new federal funding is set aside for rural communities in the Charging & Fueling Infrastructure Competitive Grant Program through the Bipartisan Infrastructure Law signed in November 2021. Additional funding for EVs and charging infrastructure is available through existing federal programs like the Federal Transit Administration's Low or No Emission Vehicle Program, U.S. EPA's Diesel Emissions Reduction Act (DERA) Program, and the Federal Highway Administration's Surface Transportation Block Grants, putting EVs well within reach for rural communities today.¹

This report is a resource for rural communities that are beginning or continuing their journeys toward widespread adoption of EVs. It covers the basics of EVs, steps to accelerate EV deployment and adoption, the benefits of EVs, manufacturing trends, charging infrastructure, and financial and technical resources available to support communities' efforts. Rural communities can take action now that will quickly vault them to the forefront of this historic transformation, positioning them to seize the benefits of an electrified transportation future.

¹ U.S. Department of Transportation, U.S. Environmental Protection Agency: <https://www.transit.dot.gov/lowno>, <https://www.epa.gov/dera>, https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/resources/ev_funding_report_2021.pdf



Photo courtesy of Proterra



Photo courtesy of Rivian

Electric Vehicles: The Basics

Many nations across the globe have adopted regulations, policies, and programs that have elevated the electric vehicle (EV) as a primary solution to reducing emissions from the transportation sector. This policy activity, combined with rapid advances in battery technology, has shifted global vehicle markets to favor EVs across all vehicle sectors within the next decade. In short, the future of transportation is decidedly electric.

EVs are vehicles that are powered partially or completely by electricity. EVs include battery electric vehicles, **BEVs**, which are solely powered by electric motors that use energy from rechargeable batteries, and plug-in hybrid electric vehicles, **PHEVs**, which utilize batteries, electric motors, and back-up internal combustion engines. BEVs have zero tailpipe emissions.

Hybrid electric vehicles (**HEVs**) use batteries and regenerative braking to improve fuel efficiency, but they cannot be plugged in and are thus not considered EVs. An EV has a charging port that allows it to connect to a source of electricity to charge its batteries.

EV adoption rates across the U.S. are rising, with EVs now representing about 2% of total vehicle sales.² In California, the national leader, more than 10% of all new vehicles sold are EVs.³ During the past decade, a substantial portion of EV sales were in markets where policies and regulations required these vehicles to be sold.⁴ But their appeal has widened as traditional original equipment manufacturers (OEMs) are shifting their business models to manufacture more EVs, and the market has seen the arrival of many new EV manufacturers, such as Tesla, Rivian, Lion Electric, Proterra, Arrival, Lucid, Canoo, and Bollinger. EVs are available to meet the needs of an increasing number of applications, with dozens of offerings in store in the light-, medium-, and heavy-duty vehicle sectors.

Charging Infrastructure

There are already tens of thousands of EV charging stations throughout the United States, including many in rural areas. Development of charging infrastructure must continue at a rapid pace to meet the needs of the tens of millions of EVs that will set out on U.S. roads in coming years.

² Wane.com (July 24, 2021). Which states have the most electric cars? <https://www.wane.com/news/which-states-have-the-most-electric-cars/>

³ Szczesny, Joseph (Aug. 9, 2021). Sales of EVs gain market share in California, The Detroit Bureau.

<https://www.thedetroitbureau.com/2021/08/sales-of-electric-vehicles-gain-market-share-in-california/>

⁴ These states are called the “ZEV states” and include California, Colorado, Connecticut, Maine, Massachusetts, Maryland, Minnesota, New Jersey, Nevada, New York, Oregon, Rhode Island, Vermont, Virginia, and Washington. <https://ww2.arb.ca.gov/our-work/programs/zero-emission-vehicle-program/about>

An EV charging station can be as simple as a 120V outlet – the same type of outlet used to charge a phone or power a lamp. This kind of charging is called “Level 1” (L1). “Level 2” charging (L2) requires a 208-240V outlet, just like a clothes dryer. L2 chargers are commonly found in public places like shopping centers, libraries, and parking garages to provide charging during daily activities. It is important to note that choosing the right charging station for drivers of light-duty vehicles requires consideration of driving patterns and behaviors. For most EV drivers, 80% of their charging is done at home with a L1 or L2 charger. Home charging stations are not difficult to install and usually do not require any major electrical upgrades. Because the majority of light-duty vehicles are parked overnight, EVs can charge primarily during off-peak hours (8 p.m. – 7 a.m.), taking advantage of extra capacity on the electrical grid.

DC fast charging (DCFC) is necessary for light-duty vehicles travelling long distances along highways. Output from DCFC stations can range from 50-350 kW. Depending on the battery and software, a vehicle can charge from a near depleted battery to 80% charged within about 30 minutes; the higher the output, the faster the vehicle can be charged. If many 350 kW charging stations are located close to one another and will all be used at the same time, it may be necessary for the electrical grid to be upgraded to support that additional usage.


Fleet vehicles typically use L2 or DCFC. Fleets with high daily usage, multiple shifts, or high demand (e.g., taxis, delivery services, transit buses) often use fast charging in their depots. These fleets may also use en-route charging, including via wireless inductive charging stations. Medium- and heavy-duty vehicles typically use L2 or DCFC stations, depending on the classes of vehicles. The number of vehicles, the sizes of the batteries, and the times the vehicles are parked are all factors that determine the number and types of charging stations needed.

The figure below from the Federal Highway Administration lists the operational characteristics of the various types of EV charging.⁵

The United States is poised to exponentially grow its charging infrastructure in the next few years. States across the country are working to build out a nationwide network of EV charging stations along highways and in communities, using funding made available from the Bipartisan Infrastructure Law. All levels of EV charging have a place in the charging ecosystem. It will be important for rural communities to engage with their state transportation agencies to develop the best possible projects.

Public investment in charging infrastructure is at an all-time high because of funding from Volkswagen Clean Air Act Settlement funds and local electric utility programs.

Representative Operational Characteristics of EV Chargers for Light-Duty Vehicles

Charger Type	Primary Use	Typical Power Output	Estimated EV Charge Time from Empty (~60 kWh battery)
Level 1 	Residential Charging	1 - 1.5 kW	40 - 50 hours
Level 2	Residential and Public Charging	7 - 19 kW	4 - 10 hours
Older Level 3 DC Fast Charge	Public Charging	50 kW	< 1 hour [to 80% charge]*
State-of-the-Art DC Fast Charge	Public Charging	150 kW +	20 minutes [to 80% charge]*

* Note: To prolong battery life, charging slows after an 80% charge level is reached.

⁵ https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/resources/ev_funding_report_2021.pdf

Private charging companies are growing fast, and more vehicle manufactures, such as Ford and GM, are focusing on developing, installing, and selling EV charging stations. Rural communities that reach out to potential partners and begin planning efforts now will be best positioned to take advantage of these and other resources that become available.

Five Steps to Accelerate EV Deployment and Adoption

Rural community leaders must take action now to capitalize on this EV moment. A strategic approach and advanced planning - outlined in the five steps below - will yield major dividends in the future.

1. Develop a community plan for the buildout of publicly accessible EV charging infrastructure.

To prepare for EV adoption by consumers and fleets, a rural community needs a plan for EV charging infrastructure development. The plan should include a prioritized list of locations for publicly accessible EV charging stations and identify the level of charging best suited to each location (Level 1, Level 2 or DC fast charging). The community should also compile and analyze the existing driving patterns of consumers and fleets, including the following:

- The range of distances drivers travel
 - Residents
 - Workers/commuters
 - Public-sector fleets
 - Private-sector fleets
 - Visitors
- Availability of public transit
- Availability of workplace charging
- Central locations that would be convenient for drivers to charge at Level 1 or Level 2 stations and those that would be suitable for DC fast charging stations
- Composition of housing types and residential parking options
 - Single-family homes with garages and/or driveways that could accommodate overnight charging
 - Multi-unit dwellings with shared parking or on-street parking.

Information a community collects through these inquiries will help inform where EV charging stations should be built first, the number of charging stations to build, and the level of power required at each station.

The community's electrification plan should also include key policies to support the adoption of EVs. These policies include building code requirements for EV-ready

parking spaces in new construction and renovations, local government fleet electrification requirements, allowances for EV charging equipment in public rights-of-way, and a schedule for periodic updates to the community's EV charging infrastructure plan. [Electrifying Transportation in Municipalities](#), a guide for local governments published in 2021 by the Electrification Coalition (EC), includes detailed information on many policies that can assist rural communities in this planning.

2. Engage with the local utility to discuss plans for EV adoption.

A community should coordinate early on with its local utility to plan for the addition of EVs to the local electric grid and for the electrification of the jurisdiction's own fleet. Utilities may need to implement special EV electricity rates or managed charging programs to encourage off-peak EV charging. Utilities can also provide valuable expertise during the development of EV charging infrastructure plans.

Rural electric cooperatives are key partners in transportation electrification and are leading efforts across the country. In the Upper Midwest, 29 co-ops joined together to create the regional [CHARGE EV](#) network to encourage EV adoption and travel among co-op members.

In the Southeast, [Roanoke Electric](#) and other co-ops are piloting EV purchase incentives and various EV charging rate designs to better understand and prepare for increased power demands.



Photo: Electrification Coalition

3. Electrify the municipal or county fleet.

Rural communities should commit to electrify public-sector fleets, including pool vehicles, transit buses, school buses, refuse trucks, work trucks, and law enforcement vehicles. The EC has several tools available to help. The [Dashboard for Rapid Vehicle Electrification](#), or DRVE Tool, enables communities to upload existing fleet data, including vehicle makes and models, to determine the best options for EV replacement, based on total cost of ownership, emissions reductions, and vehicle availability. The [State Plug-In Adoption Resource Kit \(SPARK\)](#) is a step-by-step guide and searchable database of information resources for public-sector fleet electrification.

4. Be part of an equitable and fair state highway transportation funding solution that works for EVs.

As EVs make up an ever-greater share of vehicles on the road, diesel and gasoline tax revenues will continue to decline. Today, these fuel taxes generate a portion of each state's transportation funding for maintenance and construction of roads and bridges. EVs should pay their fair share for using transportation infrastructure, but it's important that any fees placed on EVs not be punitive or serve as a disincentive for purchasing EVs. Rural community officials should work with state transportation officials on solutions that work for all drivers and that continue to promote EV adoption. Many states are in the process of piloting programs that assess fees based on the number of vehicle miles traveled (VMT). Find more information in [Plug-In America's white paper](#) on transportation funding and EV fees.

5. Identify and engage with public- and private-sector partners that can help with going electric.

Rural communities should identify public- and private-sector partners and stakeholders to engage with during the transition to EVs. One key stakeholder is the newly formed U.S. Joint Office of Energy and Transportation, created to support the deployment of \$7.5 billion from the Bipartisan Infrastructure Law to build out a national EV charging network. The office has many resources and contacts available at its [one-stop-shop website](#). Rural communities can also partner with the EC and its EC Business Council (ECBC).

EV Benefits for Rural Communities

The benefits of an electric transportation future are substantial and numerous. EVs offer cost savings for consumers and fleet operators, improved air quality, economic development opportunities, job creation, improved national security, and lower greenhouse gas emissions. Urban and rural communities are catching on to these benefits and adopting supportive policies and programs to prepare for the shift. The sooner that communities engage in the necessary planning and implementation work, the sooner they will be able to reap the benefits that EVs offer.



Photo courtesy of Volvo Trucks

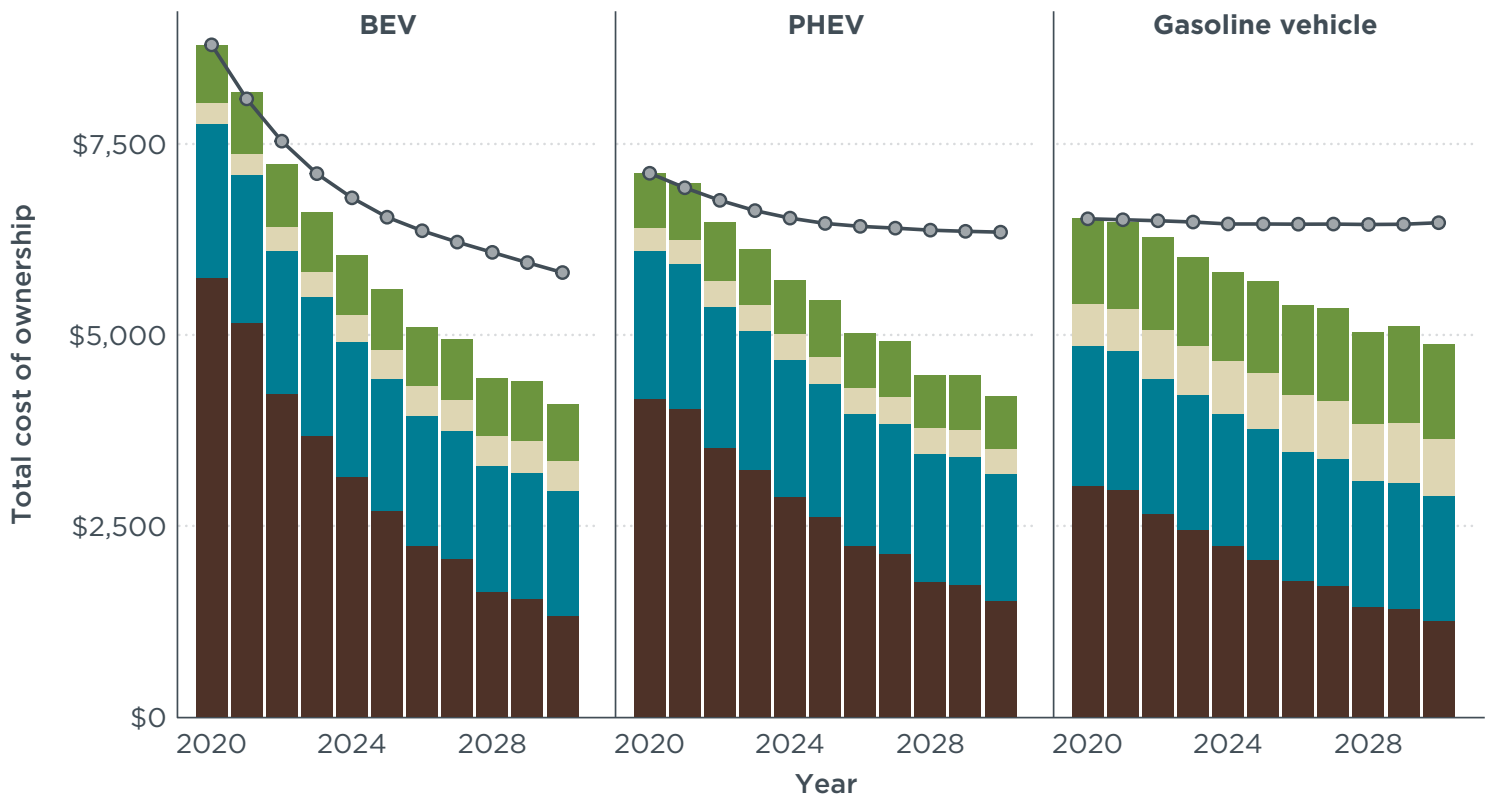
Cost Savings

EVs are often framed as being too expensive because of higher upfront purchase prices, relative to gasoline or diesel vehicles. However, rapidly declining battery costs and growing economies of scale have led several economists, including [Bloomberg New Energy Finance \(BNEF\)](#) and McKinsey, to forecast that the upfront prices of light-duty EVs will reach parity with conventional vehicles by 2024, and the purchase prices of medium- and heavy-duty EVs could be comparable with those of conventional vehicles as soon as 2027. This near-term upfront cost parity, combined with EVs' already lower fuel and maintenance costs, will translate

to significant cost savings for consumers and fleets. In the immediate term, EV purchase incentives at the federal, state, and local levels can help to address higher purchase prices.

A [study by M.J. Bradley and Associates and the Union of Concerned Scientists](#) showed that EVs will save rural drivers even more than urban drivers.⁶ Depending on the type of EV, the cost of gasoline, and the cost of electricity, annual savings for rural drivers can range from \$1,900-2,800, while urban drivers will see annual savings ranging from \$1,500-2,000. And as illustrated in the chart below, EVs' total cost of ownership is also lower than that of conventional vehicles.⁷

Model-year 2020: Cost component

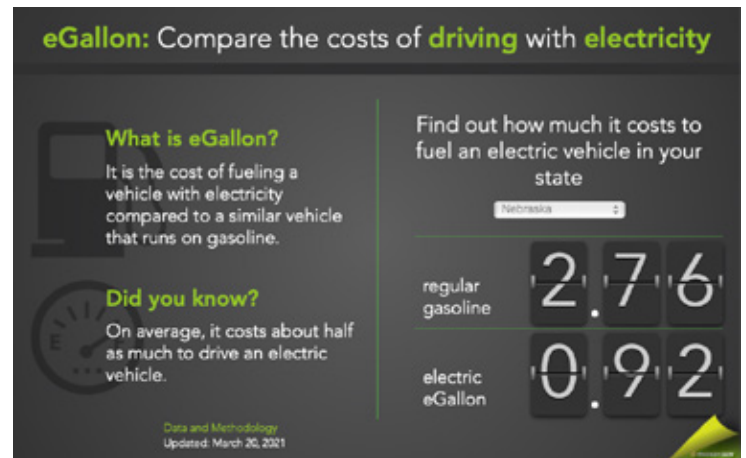


⁶ D. Lowell, C. Van Atten, J. Culkin, and T. Langlois (Nov. 12, 2020). Clean Transportation Strategies for Rural Communities in the Northeast and Mid-Atlantic States. M.J. Bradley & Associates and Union of Concerned Scientists. <https://www.mjbradley.com/reports/clean-transportation-strategies-rural-communities-northeast-and-mid-atlantic-states>

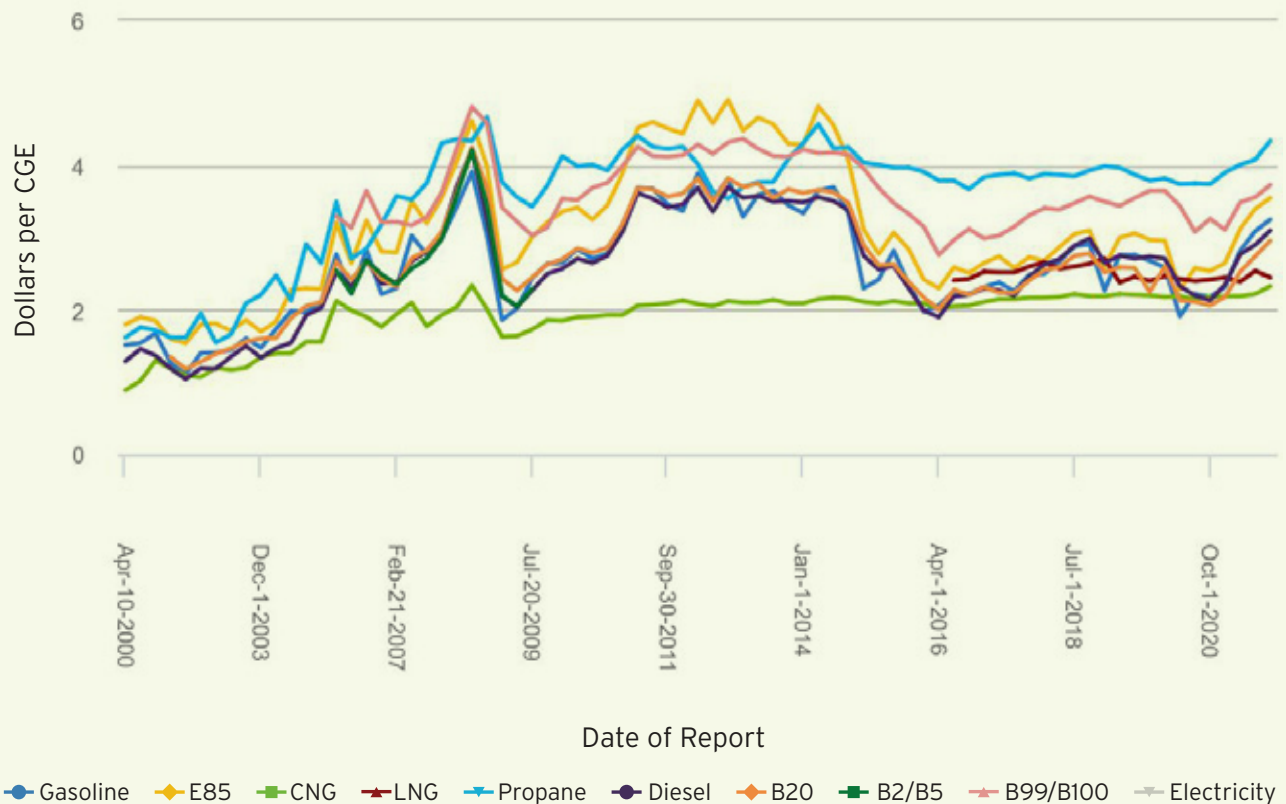
⁷ G. Bauer, Chih-Wei Hsu, and Nic Lutsey (February 2021). When might lower-income drivers benefit from electric vehicles? Quantifying the economic equity implications of electric vehicle adoption. International Council on Clean Transportation. <https://theicct.org/sites/default/files/publications/EV-equity-feb2021.pdf>

The biggest source of savings in an EV comes from fuel costs. Locally generated electricity is less expensive and has less volatile pricing than gasoline or diesel fuel. The U.S. Department of Energy's (DOE) [eGallon calculator](#) compares the cost of fueling a vehicle with electricity to the cost of fueling of a similar vehicle that runs on gasoline.⁸ In the example to the right, a gallon of regular gasoline in Nebraska costs \$2.76, but the equivalent "eGallon" costs just \$0.92.

The chart below from DOE's Alternative Fuels Data Center shows the average retail fuel prices in the United States from 2000-2018.⁹ Electricity is by far the lowest and most stably priced, while the prices of gasoline and other fuels fluctuate widely because of their reliance on volatile global markets.



Average Retail Fuel Prices in the United States



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⁸ U.S. Department of Energy (2022). eGallon. <https://www.energy.gov/maps/egallon>

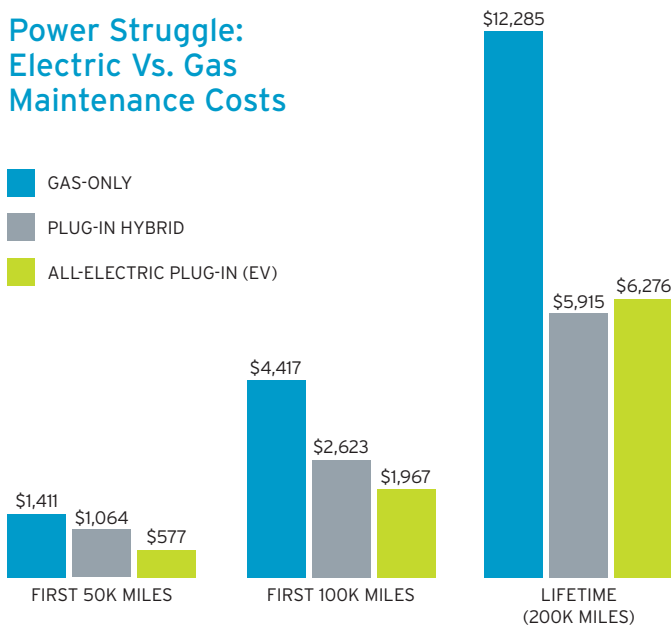
⁹ Alternative Fuels Data Center (2021). Average retail fuel prices in the United States. U.S. Department of Energy. <https://afdc.energy.gov/fuels/prices.html>

EVs also provide cost savings in the form of lower maintenance costs, which is particularly notable for residents of rural communities who travel long distances in their personal vehicles and for fleets with high-mileage vehicles. The chart below from Consumer Reports shows the maintenance cost savings available from an EV relative to a gasoline-powered vehicle.¹⁰ The savings on maintenance by driving electric are seen throughout the life of the EV. With fewer moving parts, reduced brake wear, and no need for oil changes, EVs make far fewer visits to the auto shop, according to DOE's Alternative Fuels Data Center.¹¹

Manufacturing Trends

Investments in EVs and battery technologies have grown remarkably during the past decade. And global competition has spurred every automaker to unveil a line of EVs; some OEMs have even announced goals to end the production of vehicles with internal combustion engines altogether. OEMs that have made major commitments to EV manufacturing include Arrival, Audi, Bollinger, BMW, Ford, GM, Hyundai, Kia, Lion Electric, Mini, Nissan, Porsche, Proterra, Rivian, Tesla, and others. The number of EV makes and models available to consumers is increasing rapidly, with several dozen new models slated to become available in the next few years.

Power Struggle: Electric Vs. Gas Maintenance Costs



Source: Consumer Reports' 2019 and 2020 reliability surveys.

The proliferation of new EV models is good news for rural communities, where many drivers need features that were not available in the first EVs that hit the market. Ford's move to release an all-electric version of its F-150 pickup is significant, given that the Ford F-Series was the No. 1 selling vehicle in the United States in 2021.¹² Furthermore, for drivers in rural communities, there is not just a preference to drive pickups, but a need to do so given the terrain that people drive, the work performed in these communities, and the overall utility and capability that pickups provide. Vehicles like the Ford F-150 Lightning, Chevy Silverado EV, and Rivian R1T offer new possibilities for rural drivers who need these capabilities. The new electric pickups offer hundreds of miles of range and boast performance that meets or beats their conventional counterparts. The table below shows forthcoming models of electric pickups.¹³

Electric Pickup Models: Range, Price and Availability

Model	Range	MSRP	Date Available
Rivian R1T	314 miles	\$67,000-73,000	Currently available
Ford F-150 Lightning	230-300 miles	\$41,669	Spring 2022
Chevy Silverado EV	400 miles	\$39,900	2023
GMC Sierra EV	400 miles	TBD	2023
Tesla Cybertruck	500 miles	\$39,900 - \$69,900	TBD
Lordstown Endurance	250 miles	\$52,500	Late 2022
Toyota Tacoma EV	TBD	TBD	TBD
Canoo Pickup Truck	200 miles	TBD	2023

¹⁰ Preston, Benjamin (Oct. 8, 2020). EVs Offer Big Savings Over Traditional Gas-Powered Cars

<https://www.consumerreports.org/hybrids-evs/evs-offer-big-savings-over-traditional-gas-powered-cars/>

¹¹ Maintenance and Safety of Hybrid and Plug-In Electric Vehicles (2022). https://afdc.energy.gov/vehicles/electric_maintenance.html

¹² Capparella, Joey (Jan. 5, 2022). Top 25 bestselling cars, trucks, and SUVs of 2021. Car and Driver. <https://www.caranddriver.com/news/q36005989/best-selling-cars-2021/>

¹³ (Jan.12, 2022). Every electric pickup truck currently on the horizon. Car and Driver. <https://www.caranddriver.com/news/a29890843/full-electric-pickup-trucks/>

The towing capacity of currently available EVs is equal to, if not superior to, those of their conventional counterparts. Below is a list of forthcoming EV pickups and their horsepower and towing capacity.^{14 15}

Electric Pickup Models: Horsepower and Towing Capacity

Vehicle Model	Horsepower	Towing Capacity (lbs)
Bollinger 2	614	7,5000
Chevy Silverado EV	664	10,000
GMC Hummer EV	Up to 1,000	7,500 estimated
Ford F-150 Lightning	563	10,000
Lordstown Endurance	600	7,500
Rivian R1T	835	11,000
Tesla Cybertruck	690	14,000
Canoo Pickup Truck	200 miles	TBD

EV Range in Rural Areas

The ranges of EVs have increased markedly in recent years and should not be a source of concern for rural drivers. The table to the right shows that nearly all the full-battery ranges of today's EV models are between 200 and 300 miles.¹⁶ The average length of a trip in rural areas is about 11-14 miles, so EVs on the market today can easily cover the vast majority of trips rural drivers typically travel.¹⁷ And with continued buildout of charging infrastructure along highways, EV drivers will be able to comfortably travel extended distances across rural areas.

EV battery packs undergo rigorous testing, and they can reliably operate in cold and hot climates.¹⁸ They may experience some decreased range in extremely cold climates, but typically not greater than 20%. Given the increases in battery ranges in recent years, this cold-weather decrease should not generally pose problems for drivers.

Electric Vehicle Models: Price and Range

Model	MSRP	Range
Chevy Bolt EV	\$31,000	259 miles
Hyundai Kona Electric	\$34,000	258 miles
Chevy Bolt EUV	\$33,000	247 miles
Kia Niro EV	\$39,090	239 miles
Audi e-tron GT	\$99,990	238 miles
Jaguar I-pace	\$69,900	234 miles
Polestar 2	\$45,900	233 miles
Porsche Taycan	\$82,700	199-227 miles
Nissan LEAF	\$27,400	149-226 miles
Audi e-tron	\$65,900	222 miles
Audi e-tron Sportback	\$69,500	218 miles
Volvo XC40 Recharge	\$53,990	208 miles
Hyundai Ioniq Electric	\$33,245	170 miles
BMW i3	\$44,450	153 miles
Tesla Model S	\$89,990	348-405 miles
Tesla Model X	\$99,990	340-360 miles
Tesla Model 3	\$39,990	263-353 miles
Tesla Model Y	\$53,990	303-326 miles
Rivian R1T	\$67,500	314 miles
Ford Mustang Mach-e	\$42,895	211-305 miles
VW ID.4	\$39,995	260 miles

¹⁴ J. Motavalli and B. Howard (Oct. 4, 2021). 7 electric pickups on the horizon, including Ford F-150 Lightning. Forbes.

<https://www.forbes.com/wheels/news/electric-pickups-on-the-horizon-ford-f-150-lightning/>

¹⁵ Christian Seabaugh (Nov. 10, 2021). 2022 Rivian R1T first test: it's the quickest truck we've ever tested. Motortrend.

<https://www.motortrend.com/reviews/2022-rivian-r1t-first-test-0-60-mph-review/#:~:text=The%20Rivian%20R1T%20has%20four,908%20lb%20ft%20of%20torque>

¹⁶ (September 2021). EV Guide. Plug In America. <https://pluginamerica.org/wp-content/uploads/2021/09/EV-Guide-2021-September.pdf>

¹⁷ Federal Highway Administration (2017). National Household Travel Survey. <https://nhts.ornl.gov/>

¹⁸ The world's leading EV markets are in the cold-climate countries of Iceland and Norway. These countries have not seen any slowdown in adoption of EVs due to concern over cold temperatures affecting EV batteries.

EV Policy Issues

As we work to accelerate the adoption of electric vehicles, several policy issues require attention by local, state, and federal policymakers. Supportive policies and investments in transportation electrification will set the stage for future economic development opportunities, including in rural areas.

Globally, automakers have pledged to invest more than \$300 billion into EV development and manufacturing. To ensure those investments benefit American workers and their communities, the United States must signal its long-term commitment to transportation electrification. When siting new builds and conducting plant upgrades, auto manufacturers prioritize areas with demonstrated local demand, interested leaders, and supportive policies.

State Transportation Revenue

One of the issues that must be addressed by policymakers, with input from rural communities, is state transportation revenue, which is partially funded by gasoline taxes. Policymakers in some state legislatures have imposed punitive registration fees on EV drivers, who now pay more in annual registration fees than drivers of conventional vehicles pay through gasoline taxes each year.

It is important for policymakers to understand that current declines in state transportation revenues are due to increased fuel efficiency in conventional vehicles over the past two decades and the failure to index gasoline tax rates to inflation. Punitive registration fees for EVs will slow adoption rates while doing little to address shortfalls in state transportation budgets.¹⁹ It's also important to keep in mind that EV drivers pay other taxes associated with their travel, including taxes on electricity use and their vehicle purchases.

Mileage-based user programs and other road-use fees that take into account a vehicle's impact on road conditions, tailpipe emissions, and traffic congestion can be structured in ways that work fairly for rural communities. Pairing congestion pricing with a mileage-based program creates parity for rural drivers: urban drivers may travel shorter distances, but they will pay more for driving during peak hours.

Opportunities for EVs in Rural Communities: The EV Moment is Now

Leaders in rural communities should be aware of available funding resources that can support EV adoption for their residents, businesses, and fleets. They should also stay abreast of economic development opportunities associated with transportation electrification. Many of these opportunities have limited windows, so it's important to act quickly and plan ahead.

Chargers from Sea to Shining Sea

Electrify America has built the first nationwide ultra-fast (350kW) charging network, and the investment is concentrated in rural America. The company builds its highway corridor charging stations at local retail establishments, such as grocery stores and shopping centers. These stations thus serve the residents and businesses of the communities in which they are placed. Electrify America recently announced plans to expand its network to every state in the contiguous United States. In 2021, it calculated that 96% of all Americans, including those in rural communities, live within driving distance of an Electrify America station.

"The unique capabilities of electric pickups like the R1T will redefine what Americans expect from their vehicles in performance, resilience, and energy cost savings. Rivian is already working to install charging in rural areas, and we look forward to partnering with rural communities to achieve the full scope of environmental and economic benefits nationwide."

– Jim Chen, Vice President of Public Policy, Rivian

¹⁹ Chris Harto and Shannon Baker-Branstetter (September 2019) Rising trend of punitive fees on EVs won't dent state highway funding shortfalls but will hurt consumers. Consumer Reports. <https://advocacy.consumerreports.org/wp-content/uploads/2019/09/Consumer-Reports-EV-Fee-analysis.pdf>

Current Funding Opportunities

Funding opportunities for building out and installing EV charging infrastructure, purchasing EVs, and planning for transportation electrification are available for all rural communities at the federal level. Many rural communities can also access state-based EV programs.

At the federal level, the Infrastructure Investment & Jobs Act (IIJA), also referred to as the Bipartisan Infrastructure Law, was signed into law in November 2021. The act provides \$550 billion in funding during fiscal years 2022-2026 for investments in roads, bridges, mass transit, and more. The act provides \$5 billion in funding for the buildout of EV charging stations along highways that will be distributed to states via a specific formula that is already used to distribute highway transportation funding. States will receive guidance from U.S. DOT on how to build out this network of EV charging stations across states and how to transition alternative-fuel-potential corridors into alternative-fuel-ready corridors.

The EV charging stations funded by the Bipartisan Infrastructure Law will be located in and around rural communities. Local leaders should plan to collaborate actively with their state DOT offices on the placement of charging stations, helping to identify locations with electrical grid capacity and amenities like outdoor lighting and restrooms. Only with coordination and input from rural communities will the highway network of EV charging stations be a success for light-, medium- and heavy-duty EV drivers.

The Bipartisan Infrastructure Law also provides \$2.5 billion in competitive grants for states, metropolitan planning organizations, and local communities to install publicly accessible EV charging stations. At least 50% of this funding must be allocated to communities, with priority given to rural communities and low-to-middle income communities. The EV charging stations covered by these grants can be located on any public road or in other publicly accessible locations, such as parking facilities at public buildings, public schools, or public parks, or in publicly accessible parking facilities owned or managed by a private entity. The maximum grant will be \$15 million. Up to 5% of each grant can be spent on EV education and outreach, through partnerships with schools, community organizations, and vehicle dealerships.

Other programs under the Bipartisan Infrastructure Law that rural communities can benefit from include the following:

- **Clean School Buses Program:** This grant program, to be administered by the U.S. EPA, provides \$2.5 billion in funding to replace school buses with electric school buses, and another \$2.5 billion in funding to replace school buses with zero emission and low emission school buses.
- **Grants for Energy Efficiency and Renewable Energy Improvements at Public School Facilities:** These grants can be used for the purchase or lease of electric school buses and for EV charging infrastructure installation for electric school buses.
- **Grants for Electric Transit Buses and Bus Facilities²⁰ (Low or No Emission Program²¹):** Under this grant program, at least 15% of the funds²² must be allocated to rural communities. Grants made under this program for electric transit buses must be accompanied by a long-term zero-emission fleet transition plan. Five percent of the funds in this grant program that support electric transit buses and associated charging infrastructure must be used for workforce development.

The U.S. Department of Transportation's [one-stop-shop Bipartisan Infrastructure Law website](https://www.transportation.gov/bipartisan-infrastructure-law) provides the latest information on these funding programs. Other federal programs and funding opportunities that rural communities can take advantage of include the following:

- **Diesel Emission Reduction Act (DERA):** Funding in this program is allocated through a competitive grant process to reduce emissions from diesel-fueled vehicles, including school buses. Previous grants under this program have been awarded to projects with electric transit buses, electric school buses, medium- and heavy-duty electric trucks, and electric port equipment.
- **Surface Transportation Block Grants (STBG):** The funding in this program is typically used by rural communities and states to improve road conditions on federal highways; recent guidance from U.S. DOT in April 2021 clarified that the buildout of EV charging stations can be included under this program, along with planning for EVs.

There are numerous examples of state-based funding programs that rural communities can take advantage of, including the following:

- **Charge Ahead Colorado:** This program provides grant funding to build EV charging stations. Eligible entities include local governments, school districts, public universities, public transit agencies, private nonprofit or for-profit corporations, landlords of multi-unit dwellings, and owners' associations of common interest communities.

²⁰ See Section 30018 "Grants for buses and bus facilities" of the bipartisan infrastructure law:

<https://www.congress.gov/bills/117/congress/house-bills/3684/text>

²¹ U.S. Department of Transportation: <https://www.transit.dot.gov/lowno>

²² Atlas Public Policy:

<https://www.atlasevhub.com/materials/invest-in-america-act-h-r-3684/>



Photo courtesy of Proterra

- [Smart-E Loan](#): Low-interest loans for Connecticut EV drivers to purchase Level 2 and DC fast electric vehicle supply equipment (EVSE).
 - [Electric Vehicle Charging Station Financing Program](#): Loans for the design, development, purchase, and installation of EVSE at California small businesses.
 - [Electric Vehicle Charging Equipment Rebates](#): Funding for new Level 2 EVSE purchased for use at public, workplace, commercial, and multi-unit dwelling (MUD) locations in Delaware.
 - [Electric Vehicle Supply Equipment Tax Credit](#): Funding for Georgia businesses for the purchase and installation of qualified EVSE.
 - [Transportation Electrification Grants](#): Illinois funding for investments in medium- and heavy-duty vehicle charging and electrification of public transit, fleets, and school buses.
 - [Clean Transportation and Infrastructure Loans](#): Low-interest loans for qualified Maine schools, municipalities, and nonprofit organizations to purchase ZEVs and associated fueling infrastructure.
 - [Electric Vehicle Supply Equipment Rebate Program](#): Rebates for Maryland residents, businesses, nonprofits, workplaces, multi-unit dwellings, and state or local government entities.
 - [Massachusetts Offers Rebates for Electric Vehicles \(MOR-EV\) Program](#): Rebates for residents, nonprofits, and businesses for the purchase or lease of BEVs and PHEVs.
 - [Massachusetts Electric Vehicle Incentive Program \(MassEVIP\)](#): Grants for the purchase or lease of qualified EVs and zero emission motorcycles by local governments, public universities and colleges, and state agencies.
 - [It Pay\\$ to Plug in](#): New Jersey's EV workplace charging grant program.
 - [Electric Vehicle Supply Equipment Rebate](#): Rebates for New York public and private entities for the purchase and installation of Level 2 EVSE at public parking facilities, workplaces, and multi-unit dwellings.
 - [Drive Clean Rebate for Plug-In Electric Cars](#): Rebate for the purchase of an EV in New York.
 - [Electric Vehicle Supply Equipment Rebate](#): Rebate for Utah businesses and nonprofit organizations.
 - [Alternative Fuel School Bus & Fueling Infrastructure Loans](#): Funding for the Virginia Board of Education to provide loans to school boards that convert school buses to operate on alternative fuels or construct alternative fueling stations.
 - [Volkswagen Settlement](#) funding: Funding for the build-out of EV charging stations.
- A full list of state laws and incentives can be found at the [Electrification Coalition's State EV Policy Dashboard](#).²³

²³ <https://www.electrificationcoalition.org/resource/dashboard/>

Economic Development Opportunities

Longer-term economic development opportunities related to transportation electrification in rural communities can be categorized under job opportunities, returns on EV charging investments, and savings associated with leapfrogging over other alternative-fuel vehicle technologies.

EV Manufacturing is Bringing Jobs to Rural Areas

After purchasing a shuttered Mitsubishi plant in 2017, Rivian has brought back thousands of manufacturing jobs in Normal, Illinois, and invested over \$1 billion to expand the factory. The company has also announced an investment of \$5 billion in a second manufacturing facility in rural Georgia, which will support more than 7,500 direct jobs once fully operational.

Job Opportunities

New job opportunities that stem from transportation electrification include those in the EV manufacturing and supply chain, EV charging infrastructure installation, and the utility sector. Increasing demand for EVs has spurred a number of OEMs to make investments in new battery manufacturing plants and vehicle assembly plants. In January 2022, GM announced a \$7 billion investment in Lansing, Mich., that will create 4,000 new jobs and retain 1,000 more.²⁴ Other recently announced investments include Rivian in Morgan and Walton counties, Ga.; Arrival in Charlotte, N.C.; Ford in Glendale, Ky., and Stanton, Tenn.; and Lucid in Casa Grande, Ariz.

As the EV industry continues to grow, battery recycling plants will be needed, and they will offer the potential for new jobs as well. One such plant was just announced in Covington, Ga. These are blue-collar jobs with good wages. The Covington plant is expected to generate [more than 150 jobs](#), the most of their kind in the nation. Ford's planned plants in Glendale and Stanton will generate an estimated [11,000 new jobs](#) in electric vehicle and battery production beginning in 2025.

The need for installation of EV charging stations creates shovel-ready jobs. The longer-term maintenance and occasional repair of EV charging equipment provides new job opportunities for electricians. Jobs in the utility sector will also grow as EV adoption increases and personnel are

needed to oversee EV load planning, EV rate structures, managed charging programs, and more. As rural co-ops make plans to generate more domestic electricity with distributed energy resources, job opportunities will exist to plan and strategize on ways to best to pair these resources with EV charging.

Returns on Charging Station Investments

Investments in EV charging stations can serve as economic development opportunities for rural communities. Strategically placing public EV charging stations next to businesses such as restaurants and retail stores can lure new business. Offering "destination charging" can support local tourism at public parks, golf courses, and other recreation sites. Boulder City, Nev., located about 45 minutes from Las Vegas, is one community that is strategically deploying EV charging stations. Anecdotal evidence from EV drivers suggest that drivers will spend \$5-40 when stopped to charge longer than 20 minutes.

Tourism and EVs

Jill Lagan, CEO of the Boulder City Chamber of Commerce, is no stranger to how tourism can support a thriving community. In Nevada, a state that depends on tourism, Lagan is a pro at finding ways to bring visitors to her town, located 45 minutes outside of Las Vegas on the way to the Hoover Dam. Lagan is focused on making Boulder City a one-stop-shop destination, especially for EV drivers who can charge in the downtown area. While charging, drivers can visit local businesses, grab a bite to eat, or stay longer and enjoy other activities in the town. "No one wants to pay \$4 for a gallon of gas, so more people are switching to EVs. We need to be smarter in how we handle this transition." Since Boulder City lies along a major route between Canada and Mexico, Lagan is also starting to plan for the electrification of medium- and heavy-duty trucks. "We want to be a part of the solution environmentally speaking, but also want to grow the economic development side - EVs do both."

²⁴ General Motors (Jan. 25, 2022). GM accelerates its drive to lead the EV industry. <https://media.gm.com/media/us/en/gm/home.detail.html/content/Pages/news/us/en/2022/jan/0125-michigan-investment.html>

As residents and fleet operators in rural communities transition to EVs, fuel savings will start to add up. Studies show that over the lifetime of an EV, savings can range from \$3,000-7,000. This is money that can be invested directly back into the local economy.

Leapfrogging Over Other Technologies

By transitioning to EVs now, rural communities can save millions of dollars by leapfrogging over other alternative-fueled vehicles, such as renewable natural gas (RNG) vehicles and those fueled with biofuel. A great example of this process is the transition occurring in the agricultural industry to switch to electric tractors. Companies like Solectrac, an Ideanomics company, manufacture electric tractors that deliver instant torque, increased efficiency, lower total cost of ownership, and improved workplace air quality.

Big Investment in EV Charging Stations

“Charging deserts” still exist today in many rural and underserved areas. GM will invest nearly \$750 million to expand home, workplace, and public charging. The company is developing a community charging program with more than 4,000 dealers to expand access by installing up to 40,000 Level 2 destination chargers at key locations throughout communities, including in rural areas.



Photo courtesy of Ideanomics

Being Opportunistic in Summit County, Colo.

Summit County, Colo., has three electric buses used for public transportation, in its total fleet of 27 buses. The agency also has a plan to become an EV-friendly workplace and destination, having installed 15 Level 2 EV charging ports at county offices. As a GoEV County, Summit County has committed to electrify its entire fleet by 2050. To reach this goal, officials realize the need to be opportunistic and learn as they go. “We didn’t have a strategy at first, but we knew we needed to start somewhere. When the opportunity came to apply for grant funding through state programs and the Volkswagen Settlement funding, we used that to jumpstart our transition to electric,” recalls Sustainability Coordinator Michael Wurzel. “With the commitments and goals we have to go electric, based largely on the strategies in our Community Climate Action Plan, we need to be opportunistic, start this transition now and build out our strategy on the go. The transit department is planning for a new operations center to accommodate 100% EVs, and we’re drafting a fleet replacement plan for about 200 light-duty vehicles.”



Photo courtesy of Proterra



Photo courtesy of National Park Service



Photo courtesy of Electrification Coalition



Photo courtesy of Lion Electric



Photo courtesy of National Park Service



The Electrification Coalition is a nonpartisan, nonprofit organization that advances policies and actions to facilitate widespread deployment and adoption of electric vehicles to overcome the economic, public health and national security challenges that stem from America's dependence on oil. For more information, visit electrificationcoalition.org, or email us at info@electrificationcoalition.org.