

Electrifying the Future of Mobility

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June 2018*

The scenario is all too familiar: traffic slowing to a crawl at 3 p.m. along with a sinking feeling in the pit of your stomach. The worry of not making it to work on time for the afternoon shift, getting to the day care before it closes or a loved one to an important appointment, keeping friends waiting at the restaurant, or even missing your twilight tee time becomes all too real. Elation sets in as traffic surges forward at 13 miles per hour. Climbing gas prices and smog alert days do nothing to calm your aggravation about mobility.

It's not just your imagination that traffic is getting worse. According to data analytics firm [INRIX](#), Atlanta has been ranked the number 4 most congested city in the U.S., with the eighth-worst traffic in the world and commuters spending an average of 70 hours (nearly six full days) sitting in traffic congestion each year in Atlanta. What's more, Spaghetti Junction has topped the American Transportation Research Institute's list for Worst Truck Bottleneck in the country.

This current traffic environment is being addressed through both public policy and technological advancements, including electric vehicle (EV) technology and autonomous driving. EVs provide economic and environmental benefits and are the precursor to autonomous vehicle adoption. In the future, electric, autonomous vehicles could allow the Atlanta region to reimagine communities.



Photo Credit: City of Atlanta

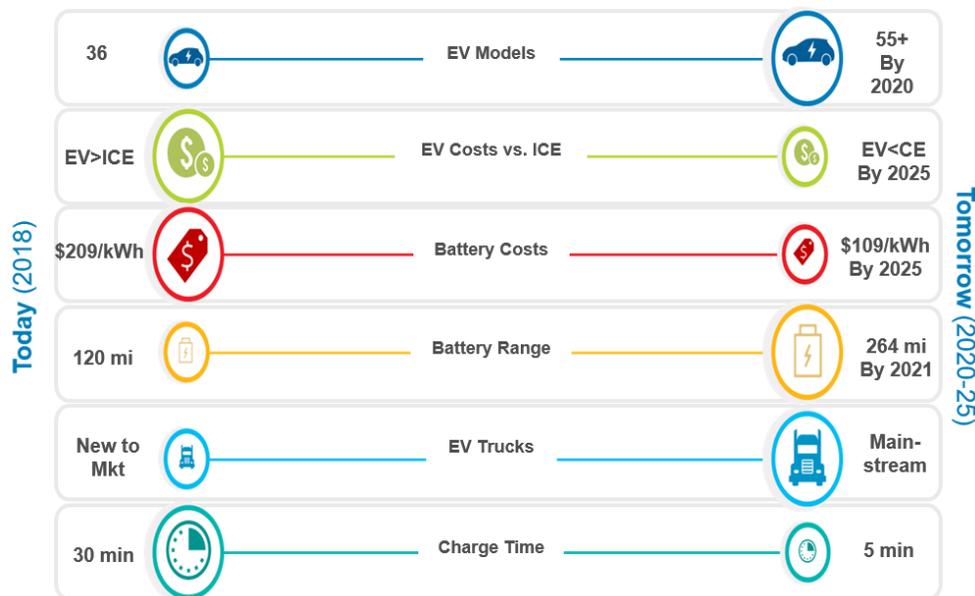
Imagine a reduced need for spacious parking lots and parking decks. Imagine less traffic as cars and trucks communicate with each other, allowing more efficient movement of goods and people. Imagine the reduction of vehicle emissions and less smog. Imagine unprecedented levels of affordable, accessible transportation to Atlanta's communities.

Autonomous vehicles, as evidenced by the long-term plans of auto manufacturers and rideshare companies, could also be the next evolution of the EV due to lower cost per mile and the ability to participate in a nimble, two-way grid. Georgia Power, as well as its parent company Southern Company, is working hard to advance these innovative technologies that will benefit the Atlanta region and the rest of the state.

Electric Transportation Benefits

Electric transportation benefits not only local drivers, but can bolster the economy, further the diversification of energy resources and promote sustainability – all critically important components to the Atlanta region as the trajectory of the city's population continues to rise.

Advancements in lithium-ion battery technology and specialty materials like carbon fiber are helping make EVs more affordable and raising performance levels. The price premium for an electric vehicle compared to gasoline-powered counterparts is also shrinking rapidly. According to [Bloomberg](#), battery prices fell 73 percent from 2010 to 2016, and should reach parity by 2025, creating a tipping point where conventional drive trains will become too expensive to produce in large numbers. These factors continue to make EVs more attractive, and the U.S. Department of Energy is projecting 225,000 EVs in the Atlanta region by 2030.

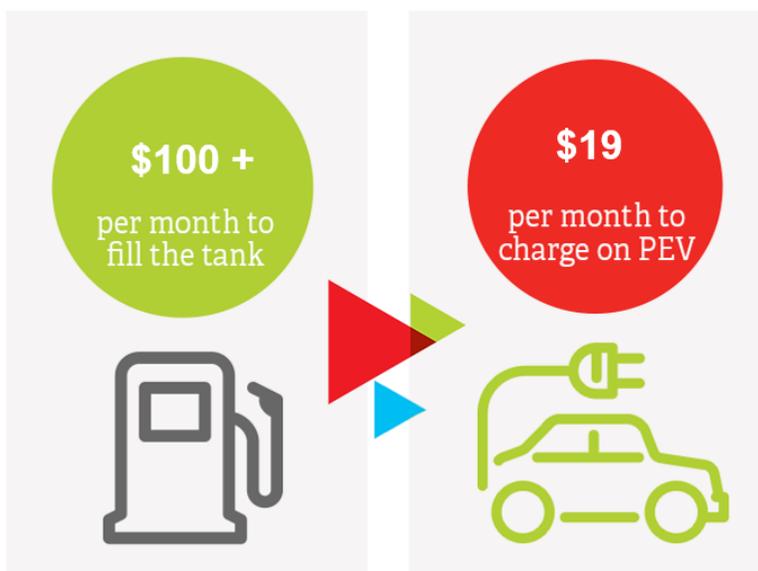


Source: Georgia Power/Southern Company

Consumer benefits

According to the U.S. Department of Energy’s eGallon tool, which measures the cost of fueling a vehicle with electricity compared to a similar vehicle that runs on gasoline, the cost per gallon electric equivalent in Georgia is 99 cents per gallon. According to [AAA](#), the average price for a gallon of gasoline in Georgia is close to \$2.82 as of June 2018. Factor in lower maintenance costs – battery-powered EVs do not require oil changes, timing belts or spark plugs, just to name a few – and the cost of ownership tilts even more in favor of EVs.

Cost savings are even more significant for Georgia Power customers. An EV driver on Georgia Power’s Plug-in EV rate, which offers low-cost nighttime charging, spends an estimate of \$19 per month using electricity as a transportation fuel. The company estimates that the driver of a gasoline-powered vehicle fueling at \$2.50 per gallon will spend more than \$100 per month.



Additionally, traffic is easier to manage for the more than 12,000 drivers currently registered with alternative fuel vehicle tags in the Atlanta region. HOT lane usage on I-75 and I-85 is available to EV drivers at no cost, plus the use of the HOV lane in the City of Atlanta limits.

Georgia Power also is leveraging its vertical assets to provide transportation solutions for the Atlanta region. Intelligent sensors installed on streetlights are enabling applications to monitor and improve traffic, parking, pedestrian movement and public safety. Georgia Power helped install hundreds of the country's first CityIQ nodes manufactured by GE across five locations in the Atlanta region. Using advanced cameras, sensors, and software, these nodes are transforming the city's existing street lighting infrastructure into a sensor-enabled data network that is accelerating the digital era of urban development. This effort will help the Atlanta region address issues such as traffic flow and parking optimization. Up to 30 percent of congestion in the most-dense cities, according to multiple studies, can be attributed by drivers circling to find parking. These projects also lay the groundwork and infrastructure needed to deploy autonomous vehicles.

The North Avenue Smart Corridor project in Atlanta, which already demonstrated an autonomous vehicle, incorporates multiple smart city technology components to promote more efficient traffic flow and safety. In less than six months, the effort has resulted in significant reductions in accidents and improvement in throughputs. Georgia Power continues to have proactive conversations about how the company's poles, cameras and smart nodes can support and enhance these efforts.

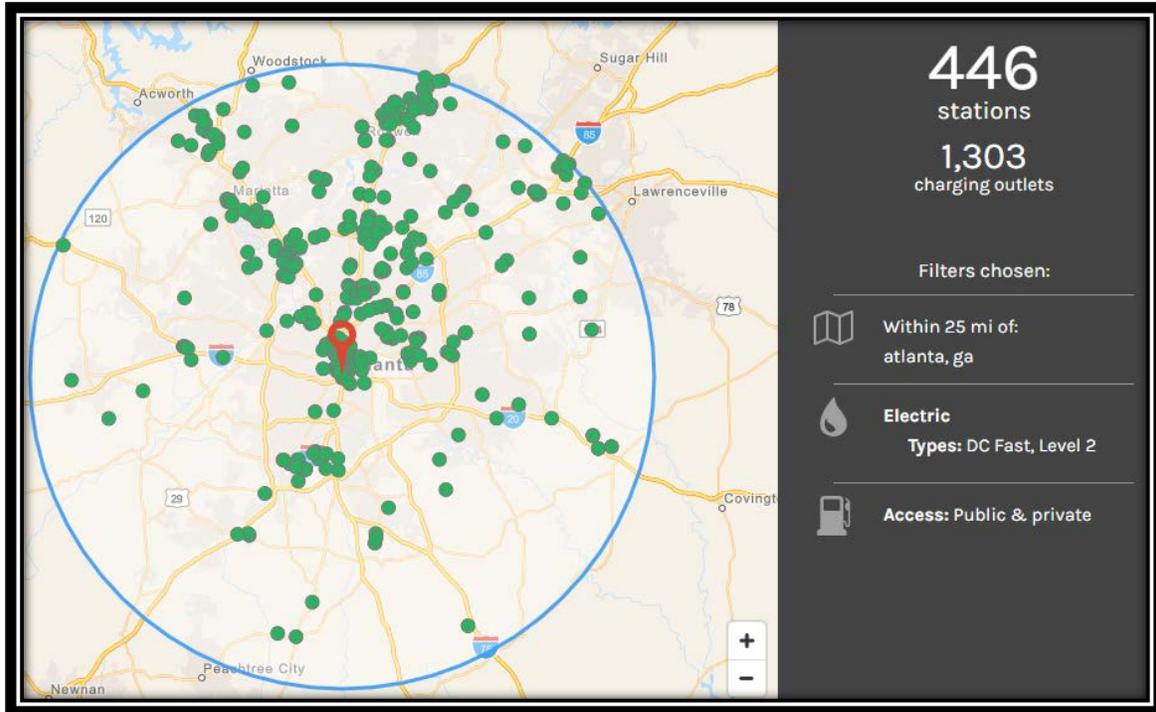
Local benefits

Electricity as a transportation fuel is a local product. A study by the Greenlink Group found that 60 percent of EV sales go back into the Georgia economy, compared to just 10 percent of gasoline vehicle sales. Approximately \$821 is kept in Georgia per electric vehicle sale per year and every \$1 of public EV funding spurs \$8 in private funding. Cost savings realized by lower maintenance costs, decreased fuel expenditures and fewer toll road fees keeps more money in the pockets of Atlanta-area residents, a boon for the local economy.

In addition to these benefits, Georgia Power residential customers are eligible to receive up to a \$250 rebate for installing a Level 2 charger in their home. To date, Georgia Power has also installed more than 20 community charging islands at prominent and convenient locations across the region to alleviate range anxiety. Additionally, Georgia Power offers a \$500 rebate to eligible business customers for the installation of Level 2 chargers.

The Atlanta region is continuing to grow with booming health and technology sectors, increased activity from Fortune 500 companies, increasing movement through our roadways and Hartsfield-Jackson International Airport. More than 100 million people a year pass through the City of Atlanta, and many businesses are recognizing the benefits to providing charging infrastructure. Mixed-use developments like Krog Street Market, Ponce City Market and Atlantic Station offer electric vehicle fast charging to the public. The Atlanta region ranks number 4 nationally in workplace charging, according to the U.S. Department of Energy's Workplace Charging Challenge, as more businesses realize the opportunity to offer a perk to their employees for less than the cost of a cup of coffee.

Existing EV charging Infrastructure within 25 miles of Atlanta



Credit: Department of Energy

A new City of Atlanta ordinance requiring 20 percent of spaces in all new commercial and multifamily parking structures to be EV ready is just one of the numerous trends and policies positively influencing the use of EVs in the Atlanta region. Midtown Alliance has zoning requirements for structures to be charging ready and Livable Buckhead has already installed almost 20 charging stations. Livable Buckhead is also developing a plan where no electric vehicle driver would be more than a mile away from a charging station for those living and visiting the Buckhead area.

In an age of rapidly growing cities, bus transit is one of the backbones of urban transport and a key connector in the future of transportation. Across the U.S. and in Georgia, more transit agencies are choosing quiet, cost efficient and modern electric bus solutions to serve this future. According to a recent article by [Mass Transit Magazine](#), as of 2017, nearly 1 in 10 U.S. transit agencies had electric buses in service or on order, citing economic factors like lower operating costs and the need to serve communities with the lowest environmental impact for urban transportation. Similarly, passenger fleets across Georgia are considering electric alternatives due to lower total cost of ownership and the ability to have a full tank at the start of each business day by simply plugging in at night.

Due to their lower speeds and fixed routes, electric shuttles will likely be among the first transit applications to reach full autonomy while regulatory frameworks are being developed to serve the passenger vehicle market. Self-driving shuttles are already in the marketplace in some U.S. cities. These pilot projects are helping cities develop systems that will enable autonomous vehicles to connect with infrastructure like traffic lights and with customers through their smart phones, enhancing the first/last mile journey by calculating the most efficient route to pick up passengers.

Atlanta's status as a critically important logistics hub also lends itself to integrating new technology into the movement of goods. Waymo, the self-driving unit of Google parent Alphabet, launched a pilot program this year in Atlanta to use autonomous trucks for deliveries.

Customer Demand in Atlanta Region:

- The City of Atlanta has 67 electric vehicles in its fleet, the largest in the Southeast
- Hartsfield-Jackson Atlanta International Airport installed 200 electric vehicle charging stations, with plans to install another 100 due to demand
- Atlanta-based UPS is adding 20 electric package cars to its fleet
- The State Road and Tollway Authority is planning to add more than 20 electric coaches

Regional Energy Diversity in Transportation

Due to weather and infrastructure issues, fuel for drivers in the Atlanta region is not always a guaranteed resource. Atlanta is dependent on critical infrastructure to move gas supplies from Gulf Coast refineries to our region. In 2008, two Gulf Coast hurricanes reduced gasoline supply by 20 percent, according to the [New York Times](#). Lines for gas stretched around the block, and gas prices were \$4.00 per gallon. Issues with gas pipelines in 2016 spiked gas prices [again](#), highlighting the impact events can have on gas and oil for transportation needs. Adopting alternative fuels for transportation gives the Atlanta region increased resiliency to move both people and goods dependably and at lower costs than traditional approaches.

Sustainability

Electrification to meet air quality standards is already occurring in the Atlanta region and environmental sustainability continues to be a focus for many of the region's leading businesses. In conjunction with Georgia Power, Hartsfield-Jackson and Delta Airlines worked to construct a new international terminal in a nonattainment zone by utilizing battery-powered ground support equipment and installing pre-conditioned air units at gates, displacing the use of jet fuel.

With zero tailpipe emissions, passenger EVs can help the Atlanta region continue its path to a cleaner and more sustainable environmental footprint. In the Southeast, a traditional gasoline car would have to travel approximately 46 miles per gallon to pollute less than an electric vehicle, regardless of the power source. Additionally, EVs can help reduce ground-level ozone and particulate matter in both urban and rural areas.

An Electric, Autonomous & Connected Future

Advancements in electrification and autonomy are occurring at exponential rates and forcing both the public and private sectors to rethink the future of transportation. According to The Boston Consulting Group, around one-quarter of all miles driven in the U.S. could be in shared, autonomous EVs due to convenience and lower cost. More than 50 companies in California alone have active autonomous testing permits. Earlier this year, GM unveiled images of its upcoming electric, autonomous vehicle without a steering wheel or pedals. The most common timeline for commercialization of autonomous vehicles is 2020-2022, which will offer urban citizens the opportunity to save thousands of dollars per year in transportation costs.

A strong connection exists between the transportation sector and the energy sector that extends to autonomous vehicles. The importance of repurposing and designing existing infrastructure – poles, fueling stations, communications networks and interstates – to promote safe, efficient transportation that allows access to jobs and enables economic prosperity and growth are goals that align very closely with Georgia Power's commitment to be a citizen wherever it serves. Georgia Power is committed to promoting safe, reliable and affordable services for all citizens in the Atlanta region.

The intersection of electric, autonomous transportation and Internet of Things (IoT) is critical to the future of the Atlanta region. In many ways, drivers are already experiencing the first steps toward autonomy with features like automatic

emergency braking and lane assist. These solutions bring the promise of significant reductions in human-related accidents, reduction in congestion and a dramatic reduction in emissions once the fleet is converted to electric.

Through the City of Atlanta pilot, Georgia Power will be exploring the ways that IoT devices on lighting infrastructure can collect traffic and pedestrian information and turn it into actionable insights that support the Atlanta region in promoting safe, efficient roads.

Our ability to move people and products through the Atlanta Region each day, will continue to play a vital role in Atlanta's continued growth and success as a region. Electric transportation must play a key role in our mobility strategy going forward.

Georgia Power remains committed to partnering with regional leaders to formulate innovative solutions to address our regional mobility challenges.