

Introduction

Atlanta's current AFV fleet

In 2010, the City of Atlanta ("the City") set a goal to have one of the largest alternative fuel vehicle fleets in the United States. By diversifying the City fleet, this will lead to cost savings, a smaller carbon footprint, and more domestically produced fuel. This transition is a component of Atlanta's overall sustainability goals and commitments.

Currently, the City of Atlanta has 66 battery electric and plug-in hybrid electric vehicles plus 36 compressed natural gas (CNG) vehicles and 7 gasoline/CNG bi-fuel vehicles. These vehicles were acquired through aggressive purchasing and an innovative leasing model that allowed the City of Atlanta to indirectly take advantage of a federal electric vehicle (EV) tax credit to purchase vehicles.

Current fueling infrastructure

The City of Atlanta currently has two compressed natural gas (CNG) fueling stations both with fast-fill and time-fill capabilities, one at 128 Claire Dr. SW and the other at 1139 North Ave. These stations were installed by Atlanta Gas Light (now Southern Company Gas) and support our current CNG fleet with opportunities to expand the fleet.

We currently have 69 electric vehicle charging stations with eight more being installed in 2018 throughout the City limits. These stations support our 66 plug-in electric vehicles and the future addition of electric vehicles coming into the City's fleet in 2018.

The installation of infrastructure is based on identifying prime locations that enhance City operations. In the case of electric vehicles, data is used to not only to determine vehicle replacements, but also sites for charging stations to support electrifying the fleet.

Successes and Challenges

The City of Atlanta has begun diversifying its fuel usage and successfully deployed the largest municipal electric fleet in the State of Georgia. The City has enacted policies that support public adoption of electric vehicles and will continue to educate the public on benefits of alternative fuel vehicles and what they mean for them.

The greatest challenge Atlanta faces is education and showing the benefits to as many stakeholders as possible. The Office of Resilience and Office of Fleet Management will continue to work with our partners, like the Electrification Coalition, Georgia Power, and Southern Alliance for Clean Energy among others to ensure proper public engagement and sound policies.

Goals and Commitments

The City of Atlanta has established a goal to reduce emissions from transportation by 20% from 2009 numbers by 2020. This is coupled with a commitment to transition over 12% of the City's fleet to alternative fuel vehicles and 20% of the fleet to electric vehicles by the end of 2020.

Investment into cleaner fuels is good for the City's air quality to lower emissions, saves tax-payer dollars by lowering maintenance and fuel costs, enhances our national security by reducing dependency on foreign oil, and creates local jobs in Georgia.

The City is fuel agnostic when selecting an alternative fuel and will continue to use data-driven decision making to determine which vehicles are ideal candidates to replace with alternative fuels

Reaching the set goals will require continued partnerships with entities such as the Electrification Coalition, Southern Alliance for Clean Energy, Georgia Power, Southern Company, and Clean Cities Georgia. These partners have provided valuable technical, policy, and financial opportunities and support in the City's efforts towards alternative fuels.

Fleet Policy

Green Fleet Procurement

The City of Atlanta has informally adopted a green fleet procurement policy as a group of standards as the fleet transitions to alternative fuel.

Gaseous Fuels

The City of Atlanta is fuel agnostic and pursues any alternative fuels that displace gasoline and diesel. We work through Clean Cities Georgia with connections with private vendors who can provide technical expertise and support when identifying vehicles in the municipal fleet.

These fuels can be biodiesel, compressed natural gas (CNG), and/or propane. If electric vehicles are not a viable option for transition, then we will look at one of the aforementioned fuels that produce lower emissions compared to gasoline and diesel.

Currently, the City has 43 CNG vehicles with the majority of these being refuse trucks in Solid Waste Services. CNG has been more successful with the heavy-duty fleet due to these vehicles having localized routes and lower NO_x emissions.

If the City does decide to expand the use of other gaseous fuels, local routes and cost of fuels will need to be considered. It is important to remember that prices for gaseous fuels don't fluctuate as much as gasoline and diesel. There is a chart of fuel costs in the Total Cost of Ownership section from January of 2018.

Data-Driven Decision-Making

It is highly recommended to start with right-typing/right-sizing measures such as developing car shares and/or reassigning vehicles to other operations either within or between departments. After conducting an analysis around this, then identify vehicles that can be transitioned to alternative fuel vehicles.

a. Right-Sizing/Right Typing

i. Car pools w/in departments (Watershed example)

1. The City of Atlanta Department of Watershed is currently developing a carpool program to support 200-250 employees rather than have one car for each driver. Because each driver may not need to have a car at their disposal every day, there is an opportunity to increase car-sharing and decrease idle vehicles. The goal of this program is to eliminate under-utilized vehicles, optimize their fleet operations, decrease the number of light-duty vehicle purchases, and reduce light-duty maintenance costs and older surplus vehicles.

By analyzing their fleet, Department of Watershed was able to identify vehicles that could be reassigned, removed, and participate in the carpool. They are estimating saving almost \$2 million dollars over the course of five years by implementing the program efficiencies. The electric vehicle fleet assessment that stated forty vehicles would be ideal candidates for electric vehicles based on their operations could be used for other vehicles in the fleet.

ii. Setting criteria for removing surplus

1. **The City of Atlanta has created a set of criteria to remove surplus in order to reduce unnecessary cost.** This set of criteria tells the City which vehicles are costing departments money and how best to utilize their vehicles.
2. **Life cycle**
 - a. Is the vehicle past its life cycle of 7 years for light-duty vehicles?
3. **Cost to maintain**
 - a. Is the vehicle costing more than \$1.00/mile to maintain?
4. **Annual Vehicle Miles Travelled**
 - a. Is the vehicle travelling less than ____ miles/year?
5. If the answer is yes to all three questions, then this vehicle is a surplus vehicle that needs to be removed or reassigned for greater optimization. If the answer to at least two questions is yes, the vehicle could be considered for re-assignment.

iii. Reassigning vehicles between departments for greater optimization

1. This is a process the City will consider when looking for new vehicle purchases. If vehicles are not past their life cycle and are surplus and/or not driving the mileage required, then they could be transferred to other departments who need vehicles and would drive the annual miles.

This will reduce overall costs and ensure an efficient fleet and this is the strategy the City of Atlanta will take.

Operational Analysis

EV Suitability Analysis

In Fall of 2017, the Electrification Coalition, a strategic partner of the City of Atlanta, conducted an electric vehicle (EV) suitability assessment on fifty vehicles in the Department of Watershed's fleet. This assessment, using data over the course of three months, provided by Verizon's NetworkFleet allowed us the opportunity to determine which electric vehicles would be ideal to replace older vehicles based on mileage, operation, location, route, and driver behavior.

Out of a pool of fifty vehicles provided by the Department of Watershed Management, the Electrification Coalition was able to identify forty vehicles that could be retired and replaced with all battery-electric vehicles such as the Ford Focus Electric and Nissan LEAF.

This assessment monitored driver behavior, daily routes, and speed which provided confidence scores for specific electric vehicles. Confidence Scores told

the City how compatible an electric vehicle would fit within the operations of the vehicles in the assessment; scores were based out of 100. This solidified the importance of data and how it can be used to make informed decisions on how best to implement alternative fuel vehicles and the needed infrastructure, in this case electric vehicles, into the City of Atlanta's fleet operations.

Georgia Power used the City's most current fleet inventory for the Department of Watershed conducted a separate electric vehicle suitability assessment that is called their "Will-It-Work" process. The results showed similar findings to the EV suitability assessment conducted by the Electrification Coalition. The crucial piece of information was identifying which vehicles would be the best investment to further the City's electrification goals.

We encourage readers to review the full summary report on the EV suitability assessment for more in-depth information.

2. Infrastructure Analysis

a. Existing vs. Needed Infrastructure

- i.** As the City adds alternative fuel vehicles to its fleet we need to make sure that there is sufficient infrastructure to support them.

This requires identifying current infrastructure and making sure that we are using it to its maximum potential. Next, the city needs to determine other locations for additional fueling/charging stations. The assessments that we conducted with the Electrification Coalition and are conducting with Georgia Power have the capability of identifying opportunities to charge electric vehicles and if more infrastructure is needed and where.

As we use the suitability assessments to determine which vehicles are ideal candidates for electric vehicles, we also use them to identify gaps in infrastructure.

For more in-depth information and specific case studies, please review the City of Atlanta and Electrification Coalition's infrastructure document on the installation of electric vehicle charging stations at Atlanta sites.

b. Fleet access vs. public access

- i.** As Atlanta installs infrastructure there will need to be a differentiation between fueling/charging stations that are accessible only to Fleet and/or accessible to the public.

Currently, 69 charging stations are available for the City's electric fleet and twenty of them are accessible and at no cost to the public. The two CNG fueling stations are only accessible to City fleet vehicles.

As the City continues to add infrastructure over the coming years, it is important to note when it comes to electric vehicle charging stations, that there are networked and non-networked stations. Networked stations come with software that usually charges the user to charge and limits access based on the ability to pay; these stations are generally the ones for public use. Non-networked stations

do not come with software and only charge the vehicle without any payment on the station required. The City only has non-networked stations and has no interest in charging the public to use the publicly accessible charging stations.

Another way to identify locations for fueling/charging stations is to work with Atlanta Gas Light, a subsidiary of Southern Company, for CNG and Georgia Power for electric vehicle charging stations. They can provide expertise on current infrastructure, future expansion, and recommendations for the City.

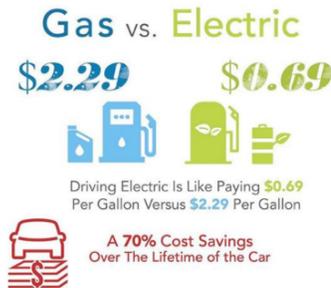
3. Total Cost of Ownership Analysis

a. Cost Savings

- i. Refer to the Fuel Economy site, <https://www.fueleconomy.gov/>, provided by the US Environmental Protection Agency (EPA) for more information on costs (fuel and maintenance) for different types of alternative fuel vehicles.

b. Fuel costs

- i. Currently, with gas at \$2.29/gallon, paying for electricity for an electric vehicle is \$0.69/ gas gallon equivalent (GGE) for the City of Atlanta.¹



 Georgia Power

- ii. According to the Alternative Fuel Data Center, in January 2018, the fuel cost for compressed natural gas was around \$2.17/gallon compared to \$2.50/gallon for gasoline and \$2.96/gallon for diesel.² See the appendix for the national average of common fuels used in the transportation sector.

c. Maintenance Costs

- i. Generally, maintenance costs are lower for alternative fuel vehicles than gasoline and diesel vehicles. Maintenance cost information can be found here: <https://www.afdc.energy.gov/>.

Finance & Procurement

Leasing Model

In December of 2015, the City of Atlanta leased sixty electric vehicles which included telematics devices, training, maintenance, and charging stations. We could participate in a new technology and fuel while not jumping in head first. This allowed Atlanta to learn best practices and put the City in the position to outright purchase these vehicles for the right operations. These practices were emphasizing the use of data for fleet transition and the process of installing electric vehicle infrastructure.

City of Atlanta Request for Proposal (RFP)

When it comes to acquiring alternative fuel vehicles, the City can either outright

¹ <https://www.georgiapower.com/>

² <https://www.afdc.energy.gov/fuels/prices.html>

purchase the vehicles or lease them through the general procurement process. The City of Atlanta has experience with both and has opportunities to participate in aggregate purchasing to meet our 20% goal. The City is reviewing options on what is the best direction to add more alternative fuels to the fleet.

Before the end of FY 2018, an RFP was placed for the leasing, lease-to-buy, or purchase of battery and plug-in hybrid electric vehicles in the form of light duty vehicles, vans, shuttles, and utility vehicles. This RFP is for a five-year period with two 1-year renewals; this goes past the end of our deadline for 20% by 2020.

EV Charging Through a Request For Proposal (RFP)

When paying for electric vehicle charging, Atlanta does need to keep in mind networked vs. non-networked stations and if they are publicly accessible or not since both components influence cost. That is explained in the Infrastructure Analysis section.

Using data like the EV suitability assessment or the Georgia Power Will-It-Work process, mentioned in the suitability analysis section, gives us the most cost-effective option and that is if we even need it for operations.

A separate RFP for infrastructure is being developed while exploring options with Sourcewell, formerly NJPA (National Joint Powers Alliance), that currently has five active contracts for EVSE (Electric Vehicle Supply Equipment).

US DOE Grant

There are opportunities for City departments to apply for grants to assist in purchasing alternative fuel vehicles. The City of Atlanta is a sub-recipient of grant submitted by the Center for Transportation and the Environment to the United States Department of Energy. The City was awarded a portion of the grant in the amount of \$223,420 that will pay for 40% of the incremental cost of new electric vehicle purchases and the charging infrastructure. This will help the city add approximately 2 CNG mini rear loader trucks, 48 battery electric vehicles, 8 plug-in hybrid vehicles and 16 charging stations by Fall of 2019.

With the EV Suitability Assessment conducted by the Electrification Coalition, we were able to identify forty that are ideal candidates to replace with electric vehicles in the Department of Watershed. We can use the grant to purchase the recommended electric vehicles that the assessment gave us. All 56 electric vehicles and charging stations may not go to Watershed, but the assessment does prove useful in the best way to use this money. Office of Resilience will work with Department of Watershed, Department of Aviation, Atlanta Police Department, and other City departments in assigning these new electric vehicles.

This grant is broken into two budget periods that end in 2020. We will work with the Center for Transportation and the Environment to implement this grant and move closer to achieving the 20% goal we have established.

The City will identify opportunities to right-size/right-type as a first step to reduce the number of unnecessary vehicles then look to add new alternative fuel vehicles.

Employee/Driver Education Programs

Operating the vehicle

As Atlanta continues to add alternative fuel vehicles to its fleet, there will need to

be efforts to educate drivers on the use of new technology.

As each department gets new alternative fuel vehicles, the Mayor's Office of Resilience will work with partners to conduct training for drivers on alternative fuel vehicles and it will allow the opportunity for them to learn about the vehicles, ask questions, participate in ride-and-drives to see the benefits of driving electric first-hand, and test out the charging process. In addition, the formation of The Sustainability Ambassador program can help to change the culture and incentivize more electric vehicle miles traveled. By normalizing electric vehicles within the workforce, we can increase the utilization rates.

Fueling/charging station etiquette

Alternative fuel vehicles have specific connections with fueling and vary between electric, CNG, and propane. As we train drivers in the operation of the vehicles there will be need training on operation and etiquette of fueling/charging stations.

Maintenance training

The City of Atlanta Fleet Services provided training to at least twenty technicians on maintaining alternative fuel vehicles. The City will continue to train its technicians in the maintenance of alternative fuel vehicles. This furthers the success of the City's alternative fuel program and supports workforce development in new and emerging technologies. The benefit of training technicians on the maintenance of these vehicles allows the City to keep maintenance work in house as opposed to contracts with dealerships.

Ongoing Program Management

Vehicle Tracking

The contract with Vision Fleet installed telematics devices into the sixty electric vehicles. These devices are provided by FleetCarma and are constantly tracking the vehicles' movements, miles, usage of battery, and emissions among other data points.

There are other companies that provide this type of service and the City uses Verizon's NetworkFleet for telematics devices on gasoline vehicles. These devices were the ones used for the suitability assessment conducted by the Electrification Coalition.

Tracking vehicles is a way to make sure to the City is getting the most on its investment and telematics will be a part of the alternative fuels program. The City is reviewing available devices on the market.

Establish & Monitor Success Metrics

As we use the telematics devices we do want to set specific metrics to achieve for each vehicle. Using the parameters, we set to right-size/right-type and identify operations for alternative fuel vehicles would be the best option. This will be key in accurately reporting on the City's electrification and transition efforts.

Reporting

The City will develop a reporting mechanism every quarter on savings and use of alternative fuel vehicles and changes in fleet size made accessible through the use of telematics.

There also needs to be an annual report at the end of each fiscal year on savings and overall fleet change. This reporting will ensure accountability and provide opportunity for review on the alternative fuels program.

Appendix

Average Retail Fuel Prices in the United States in January 2018

Fuel Types	Costs (As of Jan. 31, 2018)³
Biodiesel (B20)	\$2.84/gallon
Biodiesel (B99-B100)	\$3.84/gallon
Electricity	\$0.12/kWh
Ethanol (E85)	\$2.06/gallon
Compressed Natural Gas (CNG)	\$2.17/gasoline gallon equivalent (GGE)
Liquid Natural Gas (LNG)	\$2.66/diesel gallon equivalent (DGE)
Propane	\$2.83/gallon
Gasoline	\$2.50/gallon
Diesel	\$2.96/gallon

³ <https://www.afdc.energy.gov/fuels/prices.html>