Electrify GT Fleet Vehicles

The Feasibility of Transitioning Georgia Tech's Fleet to Electric Vehicles

2023 Ford E-Transit Electric Van

Electrify GT

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Summary

The Intergovernmental Panel on Climate Change (IPCC) reports that to limit warming to 1.5 °C and avoid the worst consequences of climate change, annual global greenhouse gas emissions must be reduced by 50% by 2030. Institutions, corporations, and individuals have a social responsibility to prevent climate change's most damaging effects by reducing or eliminating their carbon emissions. **Georgia Tech operates over 400 vehicles fueled with gasoline or diesel that produces planet-warming greenhouse gasses.** Electrify GT hopes to help reduce campus transportation carbon emissions to be consistent with IPCC targets, Sustainable Development Goals, and the vision outlined in Georgia Tech's 2020-2030 Sustainability Next Plan.

The goal of this report is to propose the quickest, economically-feasible pathway to replace the internal combustion engine (ICE) vehicles operated by Georgia Tech with electric alternatives. The scope of our work focuses on all ~400 fleet vehicles operated by Georgia Tech for which operational data is available.

This report explores three scenarios of the feasibility of Georgia Tech's fleet electrification: no electrification, instant electrification, and targeted electrification. With no electrification or fleet reduction, the Georgia Tech fleet emits 1085 mtco2e/yr[1] and costs approximately $421,000 per year in maintenance and fuel costs. By instantaneously replacing the entire fleet with electric vehicles (EVs) in 2023, fleet emissions would drop to 120 mtco2e/yr (i.e., ~90% emissions reduction) and costs will decrease to $86,000 per year for maintenance and fuel. However, by selectively electrifying the 55 highest-emitting and most expensive vehicles, fleet emissions plummet to 605 mtco2e/yr and costs to $255,000 per year (close to 50% of both quantities) at a fraction of capital investment expenditure. **We strongly recommend that Georgia Tech replace these 55 highest-emitting and most expensive vehicles to optimize carbon reduction and cost savings.** Finally, we put forward a roadmap detailing an efficient transition, explore obstacles to replacing the current vehicles, and propose mitigation measures.

[1] Metric tons of carbon dioxide equivalent (mtco2e) is a standardized unit of greenhouse gas emissions.

Electrification Pathways & Methodology

At present, Georgia Tech's operates over 400 gasoline and diesel fleet vehicles. Each of the pathways below considers substituting a certain number of these ~400 internal combustion engine (ICE) vehicles with electric vehicles (EVs). Notably, Stinger Shuttles, Stingerette Vans, and vehicles not directly owned by Georgia Tech (e.g., student or third-party transportation) are not considered due to data limitations. Additionally, low-speed vehicles (e.g., golf carts) are not considered as the vast majority are already electric-powered. Finally, trailers are not considered as they do not consume energy. Furthermore, we do not delve into downsizing the Georgia Tech fleet in this analysis, but (if deemed practical) this would also be an effective means to reduce carbon emissions and fleet costs.

For all of the following scenarios, the following data sources were used to calculate carbon emissions and operating costs. Complete calculations and data is available upon request.

1. ***Sustainability Tracking Assessment & Rating (STARS) Data*** - Complete list of Georgia Tech fleet vehicles by VIN and department.
2. ***Fleet Management Data*** - Complete list of Georgia Tech fleet vehicles with fuel use and mileage driven for 2022.
3. ***Fuel Price Data*** - Georgia Tech purchase price of gasoline & diesel for 2021 - 2022.
4. ***Electricity Price Data*** - Georgia Tech electricity prices for 2017 - 2022 with rate agreement information.
5. ***Georgia Electricity Generation Data*** - Carbon dioxide produced by electricity generation infrastructure in Georgia per Energy Information Agency (EIA).
6. ***Miscellaneous Data*** - Vehicle prices, miles-per-gallon, emissions intensity of gasoline & diesel, maintenance costs by vehicle type, etc.

The table below shows the methodology for calculating fleet replacement costs. All ICE vehicles are replaced with a comparable EV. Vehicles on Georgia state contract are prioritized.

Form Factor	Replacement Vehicle	MSRP	State Contract?
Van	Ford E-Transit	$50,000	No
Sedan	Chevrolet Bolt EV	$26,000	Yes
Compact SUV	Chevrolet Bolt EUV	$33,000	Yes
Truck	Ford F-150 Lightning	$52,000	No
Police Pursuit Vehicle	Mustang Mach-E	$47,000	Yes

No Electrification

The "No Electrification" scenario represents business-as-usual. In this scenario, Georgia Tech maintains the current ICE fleet vehicles and does not purchase any EVs. As explored below, this scenario has the highest annual carbon emissions and operating costs (fuel & maintenance).

Instant Electrification

The "Instant Electrification" scenario imagines that Georgia Tech replaces every ICE vehicle with a comparable EV in 2023. While unrealistic, this scenario demonstrates the maximum possible benefit of an electric fleet. Furthermore, it serves as a baseline for comparison to less aggressive scenarios. As explored below, this scenario has the lowest annual carbon emissions and operating costs.

However, there are a few drawbacks to Instant Electrification: high upfront investment, lack of EV charging infrastructure, employee training costs, and burden on the electric grid. First, due to the lack of commercially available EVs and high EV demand, progressively purchasing vehicles over a period of years would likely lower capital investment relative to purchasing all vehicles immediately. Second, the optimal location of EV chargers, types of chargers required, utilization frequency, and operational best practices are all questions that remain unanswered. If vehicles are purchased in bulk, a non-optimal charging strategy may be put in place, leading to inefficiency in Georgia Tech fleet operations. Furthermore, purchasing vehicles in bulk would require that all employees are quickly trained on how to operate, maintain, and repair EVs in a short period, which could interfere with day-to-day operations. Finally, by instantaneously adding 400 electric vehicles able to draw high load from the grid, Georgia Tech risks expensive peak demand electricity pricing. This is not a long term issue as EVs can be programmed to charge at off-peak (i.e., cheap electricity) hours, but it will take time to learn best practices for fleet charging. **Due to these concerns, we recommend that Georgia Tech follow a gradual approach to fleet electrification.**

Targeted Electrification

The "Targeted Electrification" scenario functions as an intermediate step between the two preceding scenarios. Instead of replacing the entire fleet with EVs, a subset of 55 vehicles that account for roughly 50% of annual carbon emissions and operating costs is chosen.[2] **By electrifying only these 55 vehicles, the majority of the annual carbon emission and operating cost benefit is captured with lower capital investment.** Furthermore, Targeted Electrification is a progressive approach to electrification, and addresses the concerns outlined in the Instant Electrification section.

[2] A complete list of the 55 targeted vehicles is provided in the Appendix of this report.

Critically, these 55 targeted vehicles are not equally distributed by department. **As Figure 1 demonstrates, certain vehicles used by the Georgia Tech Police Department, Transportation, Parking, GTRI, and the CRC have an outsized impact on carbon dioxide emissions and fuel costs.** These vehicles are high-use and often inefficiently idle, both areas where EVs can improve dramatically. Importantly, most departments have no vehicles in the top 55 as their vehicles are low-use and would not severely affect their operations. Notably, the Georgia Tech Police Department is already taking steps to replace a portion of their fleet with Mustang Mach-E's. **Before electrifying the entire fleet, Electrify GT highly recommends Georgia Tech replace these 55 highest-emitting and most expensive vehicles in the near term.**

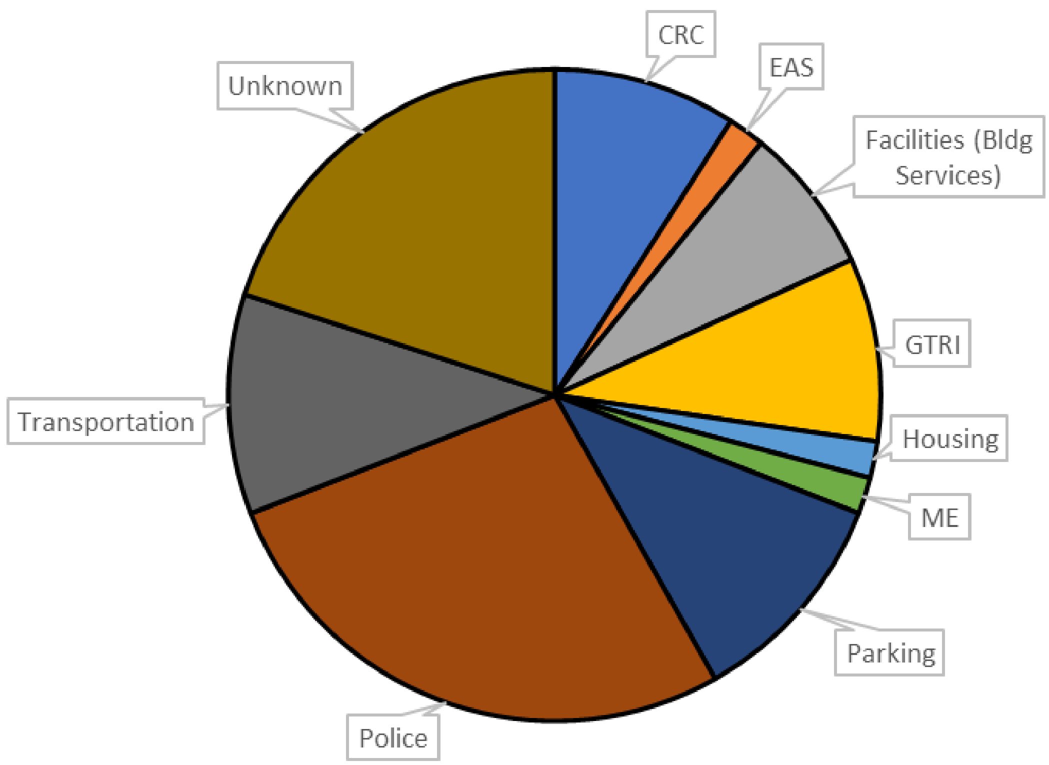

Figure 1. Targeted 55 Vehicles for Electrification by Department

Advantages of Fleet Electrification

Carbon Dioxide Emissions Reduction

Georgia Tech's fleet produces carbon dioxide emissions during operation due to the combustion of fossil fuels. While ICE vehicles emit carbon dioxide directly in tailpipe emissions, EVs produce carbon emissions indirectly during the generation of electricity by nonrenewable resources. However, the high efficiency of producing electricity at scale and electric drivetrains results in dramatically lower carbon emissions per mile driven for EVs. By using historical data from Georgia Tech's vehicle usage, efficiency factors for vehicles, and the emissions intensity of Georgia's grid, carbon dioxide emissions are estimated for each electrification scenario.

Within the No Electrification scenario, Georgia Tech produces approximately 1,085 mtco2e per year by the combustion of gasoline and diesel. By following the Instant Electrification scenario, carbon dioxide emissions would be dramatically reduced to 120 mtco2e per year from generating electricity on Georgia's grid. Finally, by following the Targeted Electrification scenario, Georgia Tech would produce 605 mtco2e annually by a combination of direct fossil fuel combustion and electricity generation. Figure 2 below shows the relative breakdown of annual carbon dioxide emissions by scenario. **By electrifying Georgia Tech's fleet, annual carbon dioxide emissions are significantly reduced.**

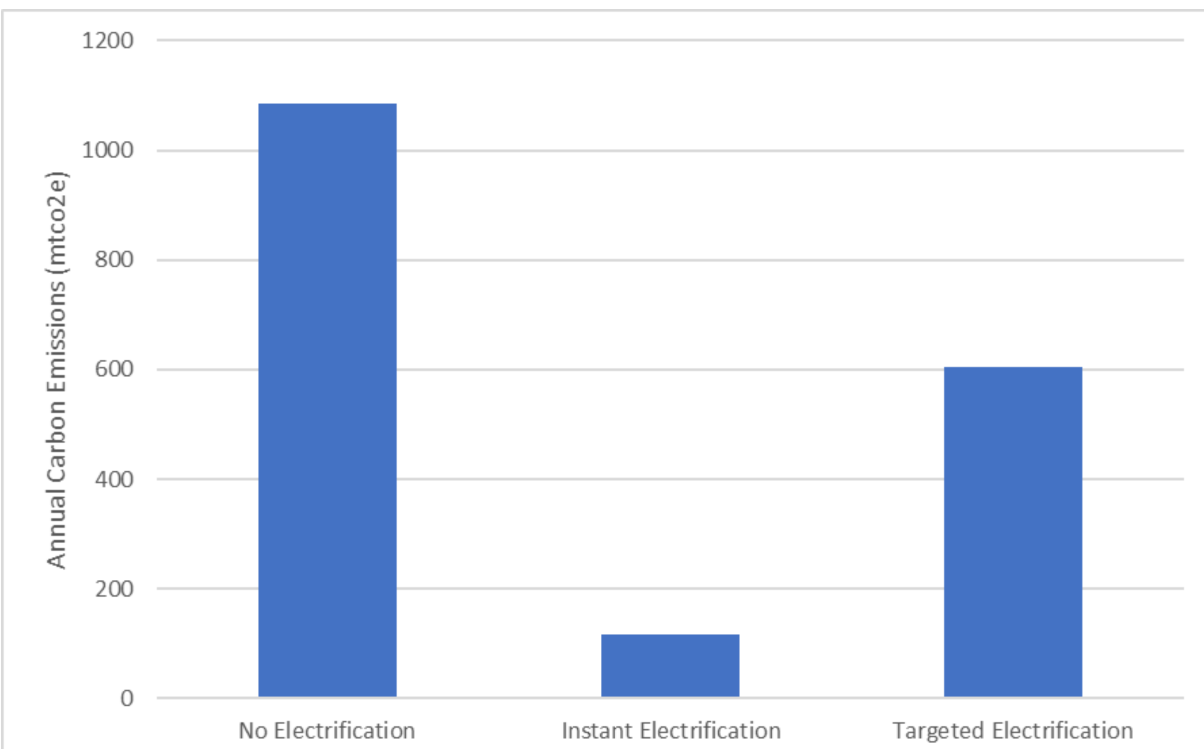

Figure 2. Annual Carbon Dioxide Emissions by Scenario

Fuel & Maintenance Cost Reduction

Georgia Tech's fleet incurs annual operating costs due to fuel & vehicle maintenance. A major advantage of EVs versus their ICE counterparts is their cheaper fuel cost per mile driven. This is due to the efficiency of electric drivetrains and the cheap cost of electricity compared to gasoline. Additionally, the reduced maintenance costs of EV's are due to the battery and electric motor requiring less maintenance and fluids than their ICE vehicle counterparts. By using historical data from Georgia Tech's gasoline purchases, electricity costs, and vehicle usage, fuel and maintenance costs are estimated for each electrification scenario.

Within the No Electrification scenario, Georgia Tech spends approximately $421,000 per year on gasoline and maintenance. By following the Instant Electrification scenario, Georgia Tech would spend approximately $86,000 per year for maintenance and electricity. Finally, by following the Targeted Electrification scenario, Georgia Tech would spend approximately $255,000 per year on maintenance, electricity, and gasoline. Figure 3 below shows the relative breakdown of annual fuel and maintenance costs for each scenario. **By electrifying Georgia Tech's fleet, annual fuel and maintenance costs are significantly reduced.**

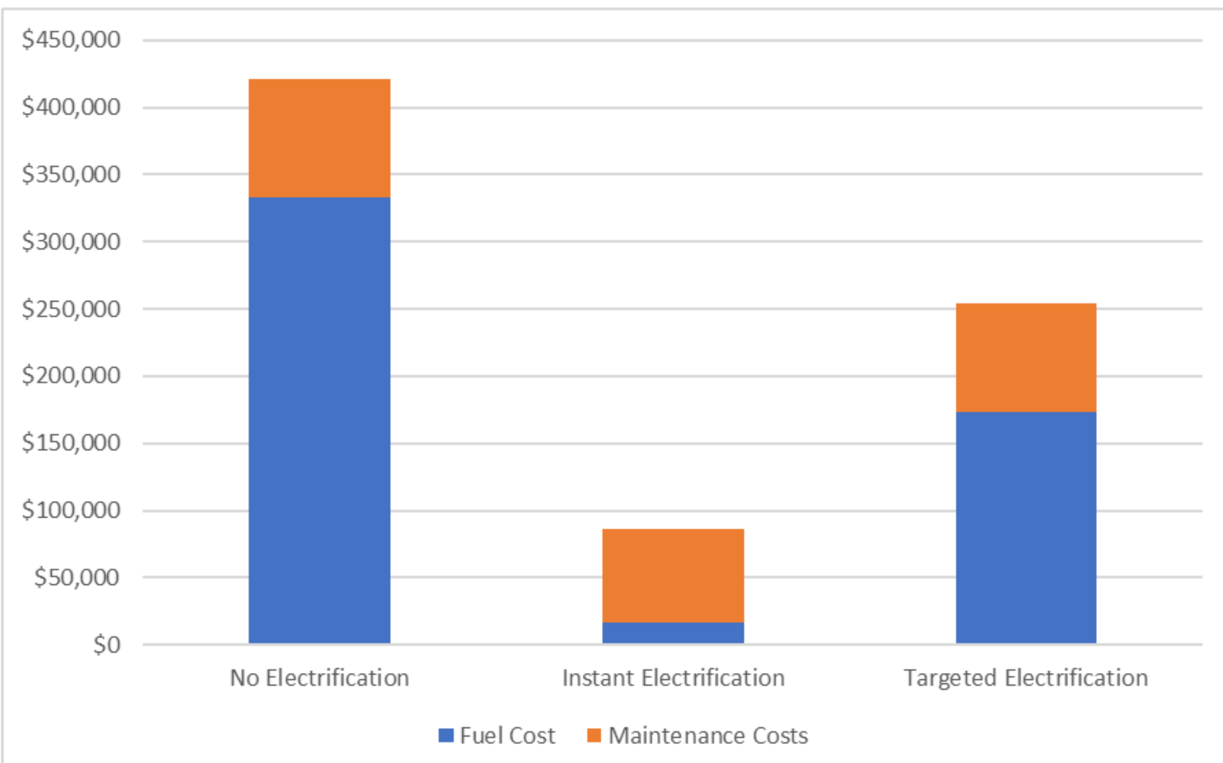

Figure 3. Annual Fuel & Maintenance Costs by Scenario

Campus Health Improvements

Another notable benefit of transitioning from internal combustion engine (ICE) vehicles to electric vehicles (EVs) is the improved health and well-being of the Georgia Tech community. Uncombusted hydrocarbons (e.g., gasoline molecules) emitted by ICE vehicles are detrimental to human health in numerous ways. For example, a metastudy that reviewed the effect of vehicular emissions on cardiovascular health came to the following conclusion: “Abundant epidemiological studies now link exposure to vehicular emissions, characterized in many different ways, with cardiovascular morbidity and mortality association.”[3] Another study explored respiratory health and exposure to particulate matter ($PM_{2.5}$) produced by vehicular emissions found that “exposure to $PM_{2.5}$ has a significant effect on admission rates for a subset of respiratory diagnoses (asthma, bronchitis, chronic obstructive pulmonary disease, pneumonia, upper respiratory tract infection).”[4] In contrast to ICE vehicles, electric vehicles produce no tailpipe emissions by shifting emissions to grid-scale electricity generation assets that are subject to stricter regulations and are gradually being replaced by emissions-free renewable energy infrastructure. **By electrifying Georgia Tech’s fleet, the negative impacts of ICE vehicles on student health and well-being are reduced by improving air quality.**

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[3] Grahame, T. J., & Schlesinger, R. B. (2010, March). Cardiovascular Health and Particulate Vehicular Emissions: A critical evaluation of the evidence. Air quality, atmosphere, & health. Retrieved August 14, 2022, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2844969/

[4] Effect of motor vehicle emissions on respiratory health in an urban area. (n.d.). Retrieved August 14, 2022, from https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.02110293

Roadmap

As mentioned above, we recommend that Georgia Tech follows the Targeted Electrification pathway to optimize carbon dioxide and operating cost reductions. Below is a year-by-year outline until 2030 of important steps to effectively implement this roadmap.

Year	Plans
2023	- Survey campus departments for information regarding vehicle requirements, constraints, and current usage. - Evaluate the current state of EV charging infrastructure on campus. - Determine pricing and best practices for the additional load on campus power grid. - Evaluate current state of GTPD electrification pilot program. - Advocate for Ford E-Transit and Ford F-150 Lightning to be added to state contract.
2024	- Identify departments to participate in the pilot program based on the 2023 survey. - Meet with vehicle manufacturers to discuss vehicle procurement partnerships and government rebate programs. - Engage with stakeholders involved in potential funding sources. - Purchase 10-15 EVs using the 55 target vehicles and the 2023 survey data. - Purchase and install charging infrastructure for 10-15 new EVs.
2025	- Collect the following data for 10-15 EVs: vehicle usage, fuel cost, maintenance cost, carbon reduction, charging data (time of day, % charged, etc.). - Build partnerships with car manufactures for more favorable EV costs. - Evaluate new EV models and add potential candidates to state contract.
2026	- Feedback rounds with departments currently using EVs. - Evaluate EV data to inform the next round of EV purchases. - Evaluate charging data to plan charging expansion for future EVs. - Purchase 10-15 additional EVs from the 55 target vehicles and 2023 survey data. - Purchase and install additional charging infrastructure for new EVs.
2027	- Continue data tracking on EVs. - Purchase 10-15 additional EVs from the 55 target vehicles and 2023 survey data. - Purchase and install additional charging infrastructure for new EVs.
2028 & 2029	- Finish purchasing EVs for the 55 target vehicles. - Finish installing additional charging infrastructure for new EVs. - Collect feedback on the transition from involved staff members.
2030	- Re-evaluate fleet electrification goals based on current project standpoint and feedback from involved departmental staff.

Cost Modeling

Instant Electrification Model

To assess the feasibility of Instant Electrification we model the payback period (i.e., time to recoup investment in EVs via annual fuel and maintenance cost savings). We estimate the full electrification of Georgia Tech's would cost $16,640,000. Additionally, we estimate Georgia Tech's current gasoline and diesel fleet to be worth $2,015,000 (which could be recovered by surplusing ICE vehicles). Finally, as calculated in the Fuel & Maintenance Cost Reduction section, the total fuel & maintenance cost reduction per year is $335,000. We note potential issues with this model in the Methodology Shortcomings & Future Research section.

This model demonstrates it would take until 2072 (or 49 years) until the initial EV investment of $16,640,00 would pay itself off from annual cost savings. Realistically, this is likely longer than the lifetime of most vehicles if purchased in 2023. This underscores a couple critical points about fleet electrification. **If all fleet vehicle electric replacements are purchased at 2023 prices, the transition to EVs becomes prohibitively expensive.** However, EV prices are expected to drop over the next decade, so targeted electrification is an attractive option to avoid the bulk of these prices. **Finally, although not explored in this report, downsizing the fleet where optimal would help to reduce excess costs of electrification.**

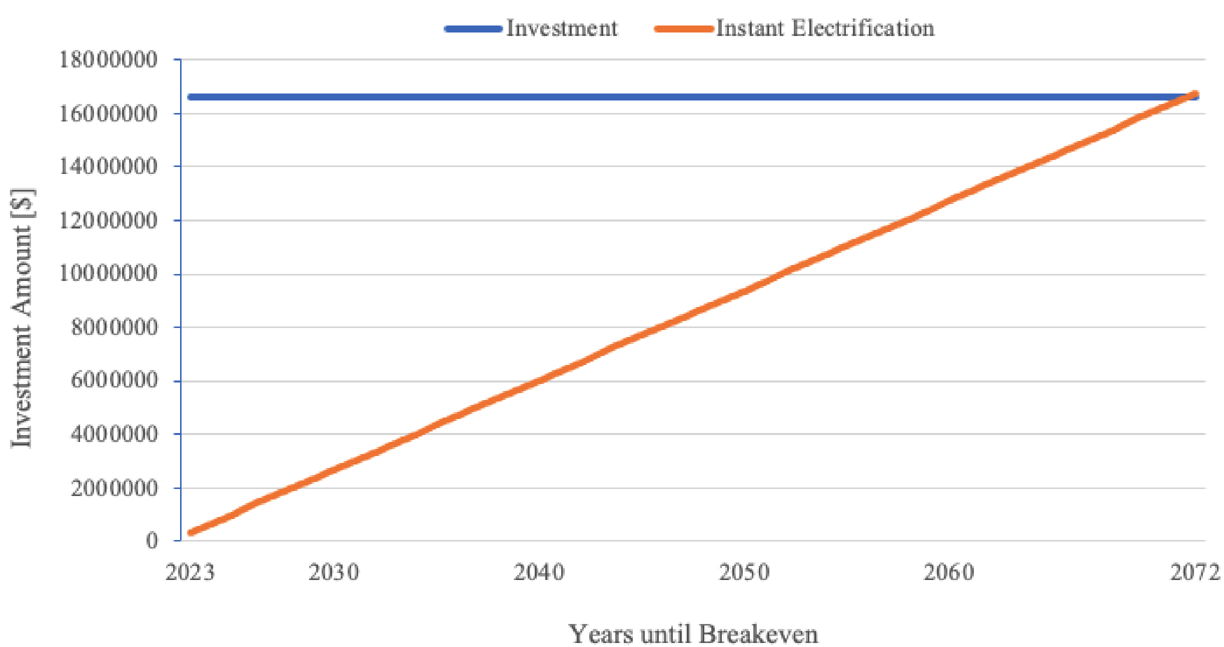

Figure 4. Instant Electrification Payback Period Model

Targeted Electrification Model

To assess the feasibility of Targeted Electrification we model the payback period of electrifying the 55 target vehicles explored in previous sections. Specifically, we compare purchasing these vehicles immediately in 2023 (denoted as Instant Change) versus following the proposed timeline (denoted as Roadmap). For the Roadmap model, we estimate that each stage of EV purchases (10 to 15 vehicles) costs roughly $360,000 - $545,000.

The model demonstrates if all 55 target vehicles are purchased in 2023 (denoted as Instant Change) it will take until 2037 (or 15 years) to breakeven. However, as mentioned in previous sections, we do not recommend purchasing these 55 vehicles at once due to further data collection that must be done on charging infrastructure and EV capabilities. **If the progressive roadmap is followed, it takes slightly longer until 2042 (or 19 years) to breakeven.** However, we still recommend following this more measured approach. **Both of these payback periods are acceptable as they fall under the reasonable lifetime for a Georgia Tech vehicle.**

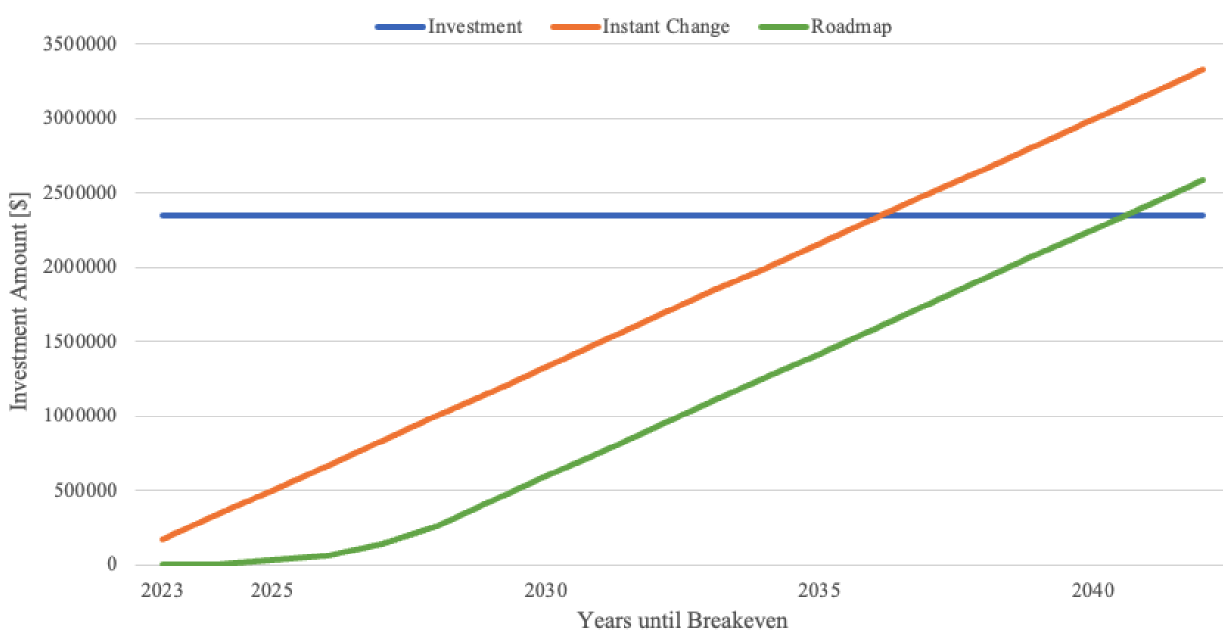

Figure 5. Targeted Electrification Payback Period Model

Obstacles

Lack of EV Options on Georgia State Contract

Many of the 55 target vehicles would need to be replaced with Ford F-150 Lightning trucks or Ford E-Transit vans. As of Q4 2022, neither are eligible for purchase under the Georgia statewide vehicle availability reports. The same applies for other new EVs and some existing models. **We recommend that Georgia Tech advocate for these vehicles (and potentially others) to be added under the state contract.**

Battery Health Uncertainty

Battery electric vehicles have only recently gained prevalence within the auto industry. As a result, many individuals and organizations have reservations about adopting EVs in their daily lives. There are multiple factors to consider from an administrative standpoint when adopting EVs, including battery degradation and charging inefficiency. EV batteries, like any other battery, degrade due to factors such as temperature, charging cycles, and time. For example, excessively warm climates shorten the lifespan of an EV battery. As the battery goes through charging cycles (i.e., depleted energy when driving and replenished energy during charging), it loses its maximum potential over time. Currently, the government mandates that EV manufacturers warranty their batteries for 8 years, or 100,000 miles, so it is expected a battery will last nearly a decade under normal usage. **Since Georgia Tech's fleet is generally low-mileage, battery health should not be a major issue, but still should be taken into consideration.** Furthermore, Georgia Tech should consider the issue of recycling the batteries once their health has sunk below optimal levels.

Charging Infrastructure

Due to the growing prevalence of student EVs and future fleet EVs, Georgia Tech must align on best practices for investment and deployment of charging infrastructure. At present, there are 3 levels of charging infrastructure rated at different power deliveries. For example, a Level 1 charger can charge a 60 kWh EV from 10% to 80% percent battery capacity in 30-40 hours, whereas a Level 3 charger can do the same in 30-40 minutes. **Georgia Tech should conduct research on the optimal number of charging stations, their respective power levels, and their geographic distribution.** During this process, research must be conducted to ensure the selected chargers will not be obsolete in the near future. Related to fleet charging, Georgia Tech should collect data and learn best practices for charging behavior (e.g., frequency of charging). **Administrative policies may need to be put in place to specify when each vehicle can charge to avoid expensive peak electricity pricing and reduce charger requirements.**

Methodology Shortcomings & Future Research

There are several issues we did not take into consideration due to the time constraints and data limitations. Addressing these problems will improve the conclusions of the project; therefore, we strongly recommend performing further research to incorporate them into a more comprehensive study.

Vehicle Idling: Most vehicles at Georgia Tech do not have high mileage. Most often, fleet vehicles idle while using their engine to maintain the internal operations. Idling gradually wears on the engine and remains as a point source carbon emission for campus vehicles. EVs are ideal for idling vehicles as they turn off their engine while idling to reduce wear on the engine. Idling likely leads to an overestimation of EV carbon emissions and electricity costs.

Additional EV Substitutes: With there being minimal electric alternatives for some fleet vehicles, especially heavy-duty vehicles, we were not able to research different alternatives for most vehicles. More research needs to be conducted on market availability and future alternatives for the current ICE vehicle lineup.

Future EV Costs: We assume that the average price of EVs will decrease by 10 to 20 percent over the next decade. However, some studies predict that by 2030, over 50% of new cars manufactured and sold in the U.S. will be EVs. Paired with developments in battery technology, it is possible that prices will be far lower by 2030. To conduct more exact cost modeling, a better estimate should be used for EV price by year.

Maintenance Costs: Through our research, we have not been able to determine concrete statistics for Tech's fleet vehicle maintenance costs. We based our calculations on Georgia Tech's fleet mileage data (by vehicle), the vehicle type, and the average maintenance costs of those vehicles (from AAA). Further research is required to determine exactly how electric vehicles are more cost effective than traditional ICE vehicles in terms of maintenance routines.

Departmental Usage: To determine which departments will benefit the most from EVs, more information is needed about the day-to-day usage of current vehicles. As outlined in the Roadmap, a departmental survey should be conducted to learn which of the target vehicles are feasible for electrification. Important factors include daily utilization, vehicle age, and current mileage.

Current Fleet Value: For this report, a rough estimate of the current fleet's value was used for cost modeling. To our current knowledge, Georgia Tech owns all ~400 vehicles in the scope of this project. We assume the average fleet vehicle is worth between $3,000 - $7,000 when surplused. That amounts to a total combined value of $1,209,000 - $2,821,000 for the fleet. However, more exact information on the actual value of the existing fleet would allow more precise modeling and potentially reduce projected costs.

Manufacturer Discounts: Building rapport with EV manufacturers will benefit this potential project immensely. By purchasing vehicles in bulk Georgia Tech could negotiate cost reductions and lower investment expenditures. Research on the feasibility of manufacturer discounts should begin imminently.

Funding Partners: Funding partners will be key stakeholders and instrumental to carrying out a successful project. Before beginning to purchase EVs, internal funding should be secured such that departments are not forced to cut other programs to subsidize EV purchases. The plan outlined in the Roadmap to start with a small number of vehicles while developing the pilot program is essential. More research and conversations should be had to secure funding for this potential project.

Federal EV Incentives: There are incentives associated with the federal Inflation Reduction Act (IRA) available to individuals when purchasing a new EV. A separate version of these incentives exists for businesses. Research should be conducted to determine whether Georgia Tech is eligible for these incentives. If so, they could dramatically reduce investment expenditure.

Appendix

The following is a list of the 55 highest-emitting and most expensive target vehicles.

VIN	Current Vehicle	Replacement Vehicle	Department
1FBNE3BL0CDB14274	2012 Ford Econoline	E-Transit	GTRI
1FM5K8AR2JGA46400	2018 Ford Explorer	Chevrolet Bolt EUV	Police
1GNSKLED1MR334207	2021 Chevrolet Tahoe	Chevrolet Bolt EUV	Unknown
1FM5K8AR2HGB41047	2017 Ford Explorer	Chevrolet Bolt EUV	Police
1FBZX2YM3JKB37398	2018 Ford Transit	E-Transit	Transportation
1FM5K8ABXMGB35039	2021 Ford Explorer	Chevrolet Bolt EUV	Unknown
1FBZX2YM3KKB13054	2019 Ford Transit	E-Transit	Transportation
1FBZX2YM7KKB13056	2019 Ford Transit	E-Transit	Transportation
1FBZX2YM5KKB13055	2019 Ford Transit	E-Transit	Transportation
1FTEW1CWXAFC63248	2010 Ford F-150	F-150 Lightning	Police
1FM5K8AB8MGB35038	2021 Ford Explorer	Chevrolet Bolt EUV	Unknown
1FM5K8AB6MGB35040	2021 Ford Explorer	Chevrolet Bolt EUV	Unknown
2C3CDXAG8EH208950	2014 Dodge Charger	Mustang Mach-E	Police
1FM5K8ARXKGA30916	2019 Ford Explorer	Chevrolet Bolt EUV	Police
1FM5K8AR4KGA53009	2019 Ford Explorer	Chevrolet Bolt EUV	Unknown
1FM5K8ARXJGA46399	2018 Ford Explorer	Chevrolet Bolt EUV	Police
1GNLCDEC6JR340353	2018 Chevrolet Tahoe	Chevrolet Bolt EUV	Police
2C3CDXAG8FH875275	2015 Dodge Charger	Mustang Mach-E	Unknown
1FM5K8AR6HGB55274	2017 Ford Explorer	Chevrolet Bolt EUV	Police
1FM5K8AR1JGA72728	2018 Ford Explorer	Chevrolet Bolt EUV	Police

1FBSS31L87DA63500	2007 Ford Econoline	E-Transit	Facilities (Bldg Services)
1FBSS31L57DA63499	2007 Ford Econoline	E-Transit	Facilities (Bldg Services)
1FBHE31Y8PHB92164	1993 Ford Club Wagon	E-Transit	GTRI
1FAHP2MK5JG107372	2018 Ford Taurus	Mustang Mach-E	Police
1FM5K8AR5HGD26001	2017 Ford Explorer	Chevrolet Bolt EUV	Police
NM0LS6E71G1262840	2016 Ford Transit Connect	E-Transit	Parking
1FMEU63E38UA83766	2008 Ford Explorer	Chevrolet Bolt EUV	Unknown
KNDMA5C18G6128932	2016 Kia Sedona	Chevrolet Bolt EUV	Transportation
1FT8W3CT1HEF20764	2017 Ford F-350 Sd	F-150 Lightning	ME
1FTMF1CM3DFC58794	2013 Ford F-150	F-150 Lightning	Facilities (Bldg Services)
1FBNE3BL3DDA43699	2013 Ford Econoline	E-Transit	CRC
1FTMF1C84GFC00801	2016 Ford F-150	F-150 Lightning	Parking
1FTRF17283NA39395	2003 Ford F-150	F-150 Lightning	Unknown
1FMJU1F56BEF46739	2011 Ford Expedition	Chevrolet Bolt EUV	Police
2C3CDXAG3EH194648	2014 Dodge Charger	Mustang Mach-E	Police
1FBNE3BL2DDA49445	2013 Ford Econoline	E-Transit	CRC
1FTMF1CMXEKF39970	2014 Ford F-150	F-150 Lightning	Parking
1FMZK1ZM2FKA65244	2015 Ford Transit	E-Transit	Housing
1FMCU0F72GUC82081	2016 Ford Escape	Chevrolet Bolt EUV	Parking
1FD0W5HT2MEC10940	2021 Ford F-550	F-150 Lightning	Unknown
2C7WDGBG9FR541972	2015 Dodge Grand Caravan	Chevrolet Bolt EUV	Transportation
1FBNE3BL8BDB29183	2011 Ford Econoline	E-Transit	CRC
1FT8W3DT5DEB25107	2013 Ford F-350 Sd	F-150 Lightning	GTRI

1FM5K7B83GGB07004	2016 Ford Explorer	Chevrolet Bolt EUV	GTRI
1FDXF47S14EC07027	2004 Ford F-450 Sd	F-150 Lightning	GTRI
1FMJU1FT8HEA24251	2017 Ford Expedition	E-Transit	CRC
1FAHP2MT4HG133884	2017 Ford Taurus	Mustang Mach-E	Police
5TEUX42N88Z475629	2008 Toyota Tacoma	F-150 Lightning	EAS
2FAHP71V88X150894	2008 Ford Crown Victoria	Chevrolet Bolt	Police
1FTMF1CM3EFB10999	2014 Ford F-150	F-150 Lightning	Parking
1FBNE31L44HB48410	2004 Ford Econoline	E-Transit	Facilities (Bldg Services)
1FTKR1AD9BPA20649	2011 Ford Ranger	F-150 Lightning	Parking
1FMJK1F58BEF52306	2011 Ford Expedition	Chevrolet Bolt EUV	Unknown
1FBNE3BL6BDB29182	2011 Ford Econoline	E-Transit	Unknown
1FMJK1F57CEF29469	2012 Ford Expedition	Chevrolet Bolt EUV	CRC