Maryland Energy Administration Clean Fuels Technical Assistance Program:

City of Rockville

March 31, 2021

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I. Executive Summary

The Maryland Energy Administration (MEA) Clean Fuels Technical Assistance (CFTA) Program has provided this fleet advisory service for the City of Rockville, through a partnership with ICF. ICF analyzed Rockville's on-road vehicle fleet comprised of 294 vehicles, recommending 20 to 61 internal combustion engine (ICE) vehicles for electrification based on current and announced electric vehicle (EV) make and model availability, which includes 20 to 38 plug-in hybrid electric vehicles (PHEVs) and up to 23 battery electric vehicles (BEVs). The higher range of these recommendations are reliant on Rockville applying for, and receiving, EV and charging station incentives. The conversions would take place over Rockville's existing 5-year lease cycle, with the actual number of vehicles eligible for electrification likely increasing over this time as more EV makes and models become available.

Based on our analysis, converting 20 to 61 ICE vehicles to EVs is estimated to produce the following impacts[1]:

$439,243 to 670,920 cost of ownership (TCO) savings over **15** years of vehicle operations

$250,385 to 357,541 fuel cost savings over **15** years of vehicle operations

$97,184 to 144,569 maintenance savings over **15** years of vehicle operations

2,141 to 3,068 metric tons of greenhouse gas (GHG) eliminated over **15** years of vehicle operations

241,000 to 345,000 gallons of gasoline displaced over **15** years of vehicle operations

equivalent to eliminating **2.5 to 3** homes' energy use annually

[1] Based on the Assumptions and Calculations outlined in Appendix 2, as then applied to the U.S. Environmental Protection Agency's Greenhouse Gas Equivalencies Calculator, https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

II. Introduction

The State Fiscal Year 2021 (FY21) CFTA Program is a new pilot, test-of-concept program which aims to provide eligible local government and municipal fleets with technical assistance as they consider alternative transportation fuel options. This program is complementary to the MEA's FY21 Clean Fuels Incentive Program. Through CFTA, a technical assistance contractor (ICF) employed by MEA was tasked to work directly with eligible fleets, selected via an application process, for the purpose of developing potential alternative fuel fleet strategies. Possible alternative fuels for evaluation include electric, ethanol, hydrogen, natural gas, propane, and other biofuels, with the selected local government or municipal fleet choosing their preferred technical for evaluation, after discussions with ICF.

III. Overview of Motivations and Priorities

The City of Rockville desires to lead by example with innovative approaches and environmental technology, save on overall vehicle life cycle costs, and reduce local air emissions contributions of the city fleet. While the city currently operates one hybrid vehicle and one plug-in electric vehicle, the city wants to expand the proportion of alternative fuel vehicles in our fleet in a cost-effective manner while continuing to carry out its duties and meeting the public's high service standards. Given Rockville's compact size of 13.57 square miles, the fleet primarily operates under low annual mileage and city driving conditions, which makes the economics of transitioning to alternative fuels economically challenging. Therefore, technical assistance is greatly needed to support this initiative.

Rockville's Mayor and Council have identified climate action as a priority. The city is in the process of developing a climate action plan that will contain policies that encompass municipal operations including greening the city's fleet. The draft plan will be tentatively available for public comment in June or July 2020. City of Rockville's greenhouse gas emissions targets currently draw on regional climate change goals set through its membership in the Metropolitan Washington Council of Governments. Targets are to reach 20% reduction below 2005 levels by 2020 and 80% reduction by 2050.

The Mayor and Council have also established the development of a sustainable fleet policy as a priority initiative for stewardship of infrastructure and the environment. Staff is working to develop a policy and procedures to purchase and use the lowest emission vehicle or equipment item possible, while taking into account the vehicle's lifecycle costs, life cycle environmental impacts, and ability to support operation and services.

The city's procurement code also provides for the use of an environmentally preferable procurement policy (Section 17-89):

"The purchasing agent will develop an environmentally preferable procurement policy which shall provide preference, to the greatest extent practicable, to products and services that will enhance and protect the environment, protect the welfare of workers, residents, and the larger global community, and represent the best overall value to the City."

Rockville's fleet management program also conducts preventative maintenance on a strict schedule to ensure optimum fuel efficiency and the city has been making policy changes to improve efficiency and safety. In FY20, the city began to work with Enterprise Fleet Management to phase much of the currently owned fleet to all-leased vehicles, swapping about 35 vehicles per year. All of the sedans, sport utility vehicles, police vehicles, vans, and pick-up trucks are participating in the Fleet Management lease program. This lease program permitted the city to reduce the traditional 15-year vehicle replacement schedule to a 5-year replacement schedule.

Rockville's fleet has some special considerations. Police vehicles, for example, incur the highest annual mileage in our fleet, but need to be able to respond to any type of emergent situation, and do so promptly, at any time, and with uncompromised functionality. Police vehicles often need to run additional in-vehicle equipment while operating to perform their duties and sometimes idle to ensure adequate power levels. Some other types of vehicles may have dual purposes and need to have the ability to be deployed quickly and to be in operation for extended periods of time to meet emergency needs. For example, the pick-up trucks are also used for snow plowing which may require around-the-clock operations following big snowstorms. The city is interested in exploring creative options that can address these needs through the strategies that support the use of alternate fuel vehicles and infrastructure. Refuse vehicles incur the highest mileage for our diesel fleet, as they perform collections for 14,000 homes in 10 hours shifts, 4-days a week, in mostly in urban driving conditions. These vehicles currently do not have access to alternative fueling infrastructure and the city would need to plan for appropriate charging or refueling infrastructure and identify options for redundancy to continue to serve these essential functions.

Since many vehicles do not drive long distances, mileage is generally low, which also makes the economic justification for clean energy fleet vehicles more challenging.

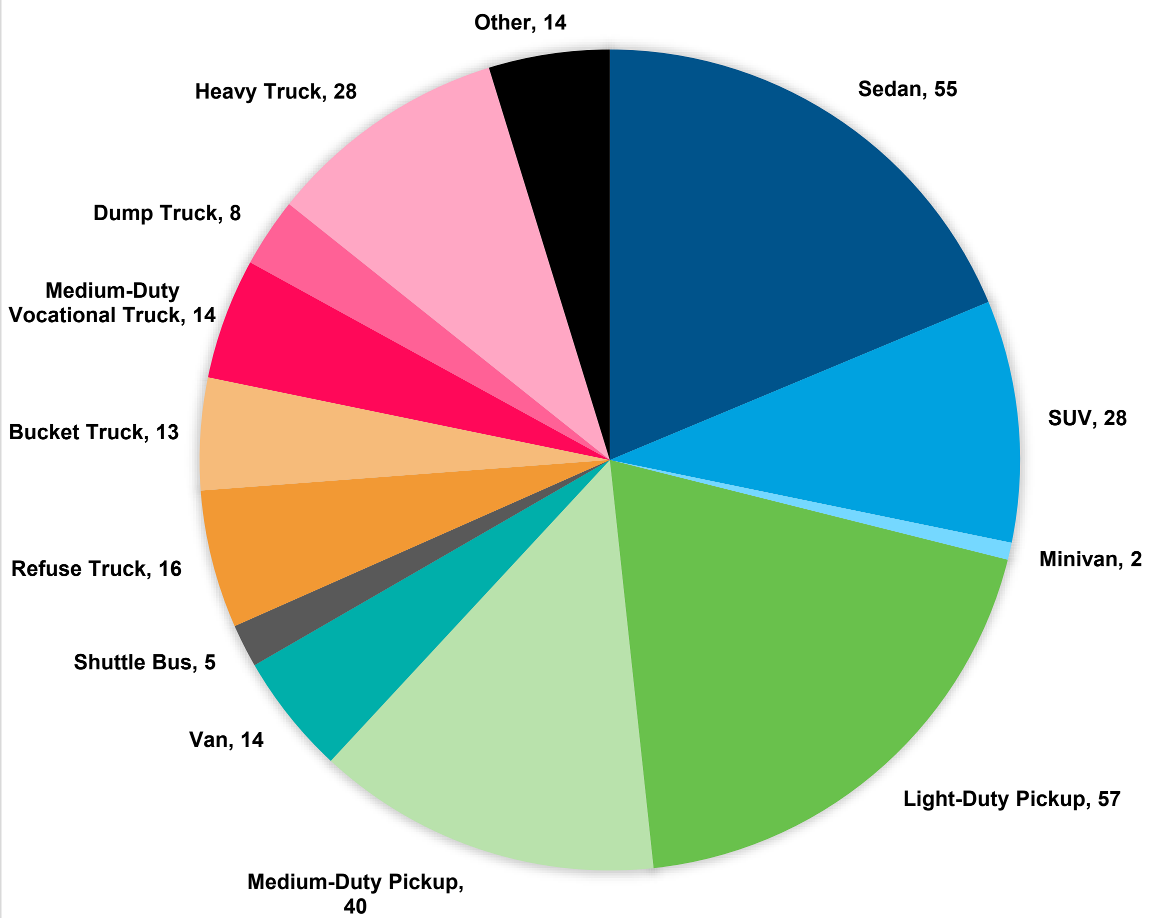
IV. Current Fleet Inventory

When applying to the CFTA Program, Rockville provided fleet data from 4 fleet departments. ICF evaluated on-road vehicles for electrification opportunities, including some light-duty vehicles for emergency response.

The fleet currently has one hybrid sedan used as a City Hall pool vehicle and one BEV used for parking enforcement. The city installed a Level 2 charging station at City Hall property for the use of the city's fleet vehicles and has a public Pepco fast charging station installed at a community center. The Police Station and the Gude Maintenance Facility currently do not have access to charging infrastructure.

Rockville's fleet is 19% sedans, 9% SUVs, and 19% light-duty pickups, as seen in Figure 1. ICF did not evaluate the off-road vehicles categorized under "other" such as motorcycles and speed camera vehicles.

FIGURE 1: EXISTING FLEET - VEHICLE TYPES



ICF did not limit this electrification study to light-duty vehicles. ICF also looked at all vehicles eligible for retirement over the next 15 years, as shown in Figure 2, and evaluated electrification opportunities based on EV model availability as announced in December 2020. Only one round of vehicle replacements was evaluated at this time, although leased vehicles have the potential to be replaced several times over this period. The exact vehicle retirement schedule is based on the assumptions identified by ICF and Rockville, as shown in Appendix 2.

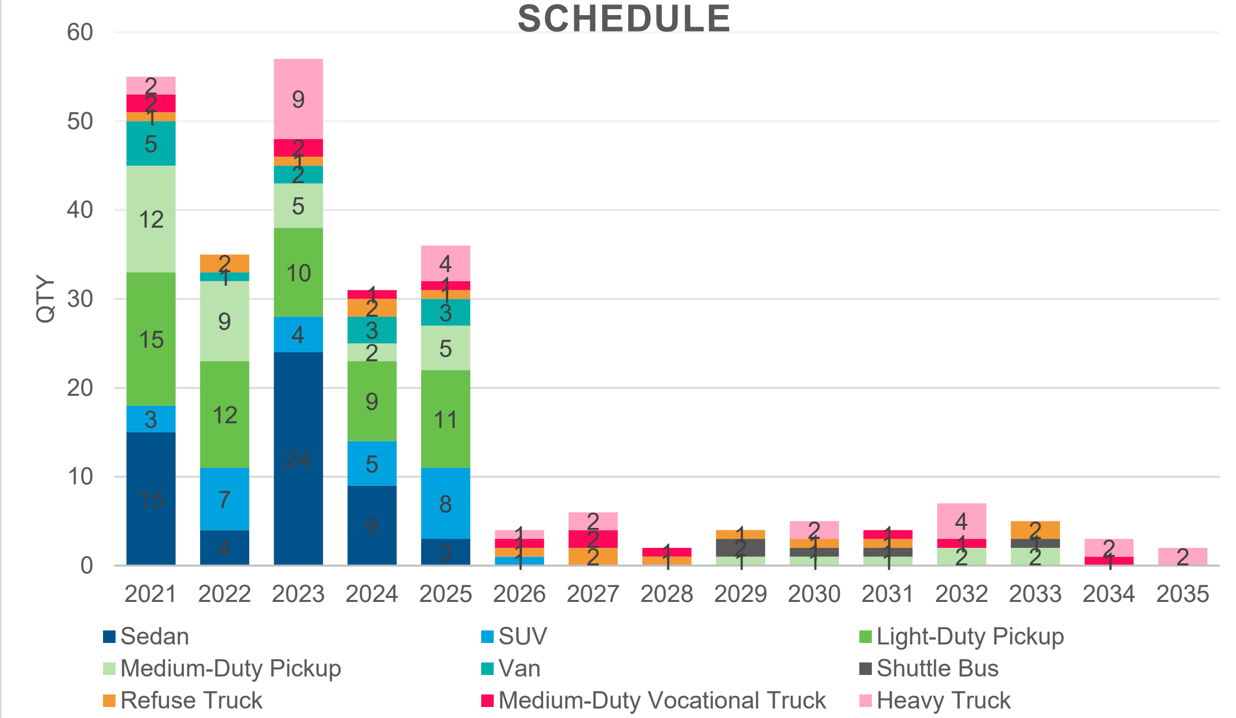


FIGURE 2: EXISTING FLEET RETIREMENT SCHEDULE

V. Electrification Best Fit and Availability Assessment

Overall, up to 61 vehicles were identified for electrification based on current and announced EV make and model availability. Table 1 shows the recommended quantities, by vehicle type, to be replaced by EVs over the next 15 years if the City receives incentives. If incentives are not attained, recommendations for electrification drop dramatically, as seen in Table 2.

TABLE 1: 15-Year Electrification Recommendations, with Incentives

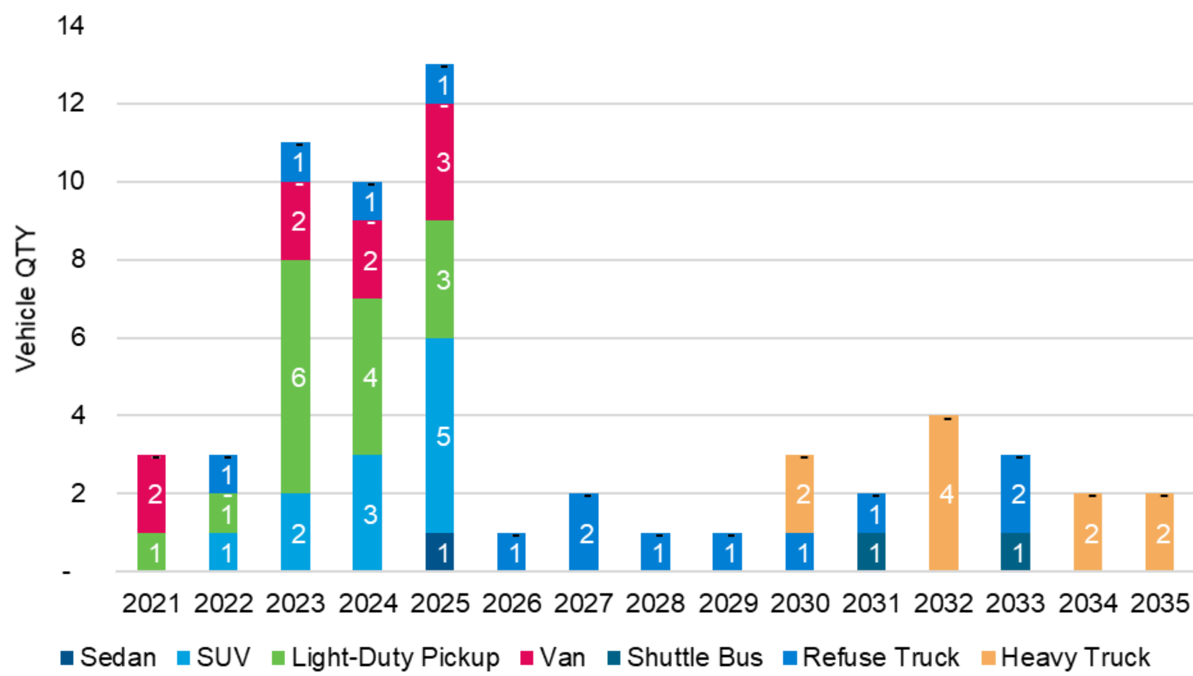
Current Fleet		Electrification Recommendations		
	Total Quantity	**Quantity Recommended to Convert to Electric**	**Total Financial Savings**	**Lifetime GHG Emission Reductions (MT)**
Sedan	55	1	$199	14
SUV	28	11	$6,433	134
Light-Duty Pickup	57	15	$9,901	126
Van	14	9	$21,459	225
Shuttle Bus	5	2	$45,433	163
Refuse Truck	16	13	$444,965	2144
Heavy Truck	28	10	$142,530	263
TOTAL	**203**	**61**	**$670,920**	**3,068**

TABLE 2: 15-Year Electrification Recommendations, without Incentives

Current Fleet		Electrification Recommendations		
	Total Quantity	Quantity Recommended to Convert to Electric	Total Financial Savings	Lifetime GHG Emission Reductions (MT)
Van	14	1	$916	94
Shuttle Bus	5	1	$32,068	107
Refuse Truck	16	10	$343,098	1710
Heavy Truck	28	8	$63,161	231
TOTAL	**63**	**20**	**$439,243**	**2,141**

The replacement timeline for the 61 vehicles can be seen in more detail below in Figure 3.

FIGURE 3: RECOMMENDED EV REPLACEMENT TIMELINE BY VEHICLE TYPE, WITH INCENTIVES



The electrification schedule begins with vans, light- duty trucks, SUVs, and even one refuse truck in 2022. It then progressed to add in shuttle buses, more refuse trucks, and other heavy-duty trucks in the later years. PHEVs were recommended for vehicles requiring a larger vehicle range than currently available in an equivalent BEV model. For future models recently announced and currently nascent EV types, recommendations for electrification do not take place until it is expected that these EV types are more comparatively priced with ICE vehicles over the TCO. Notably, no police vehicles are recommended for replacement at this time.

Figure 4, below, shows the recommendation schedule if no EV or charging station incentives are received.

FIGURE 4: RECOMMENDED EV REPLACEMENT TIMELINE BY VEHICLE TYPE, WITHOUT INCENTIVES

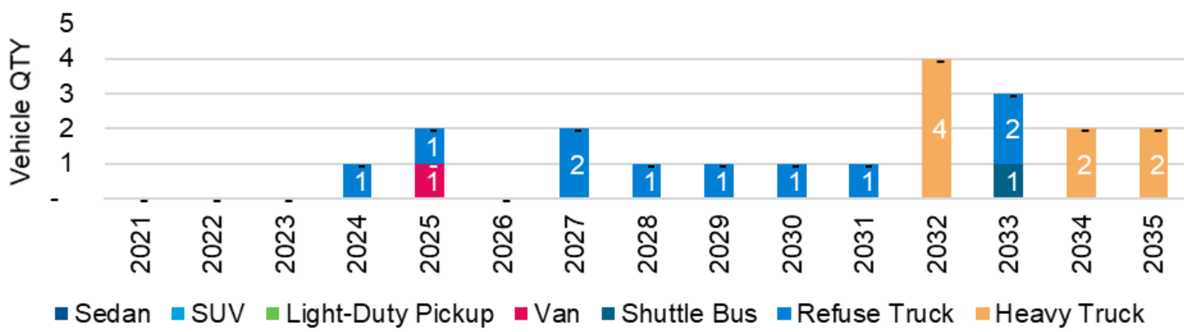
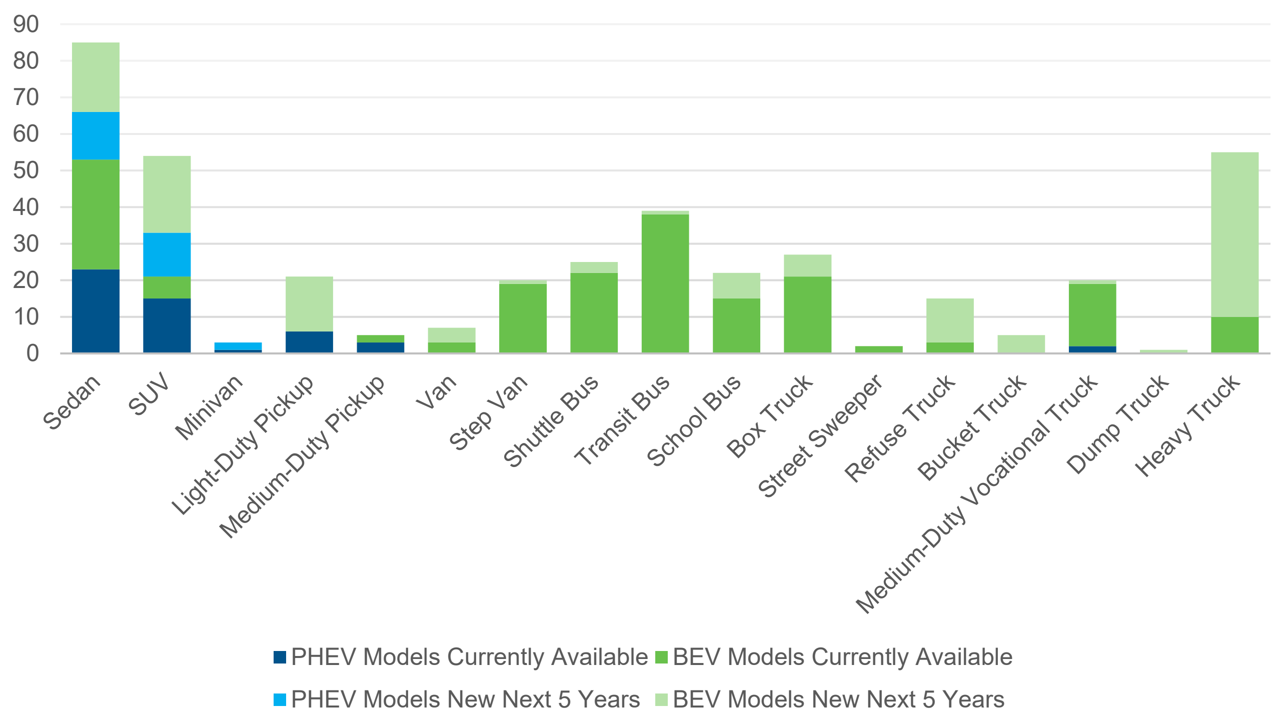


Figure 5, below, shows the market mix of existing and future EV models availability utilized for this analysis.

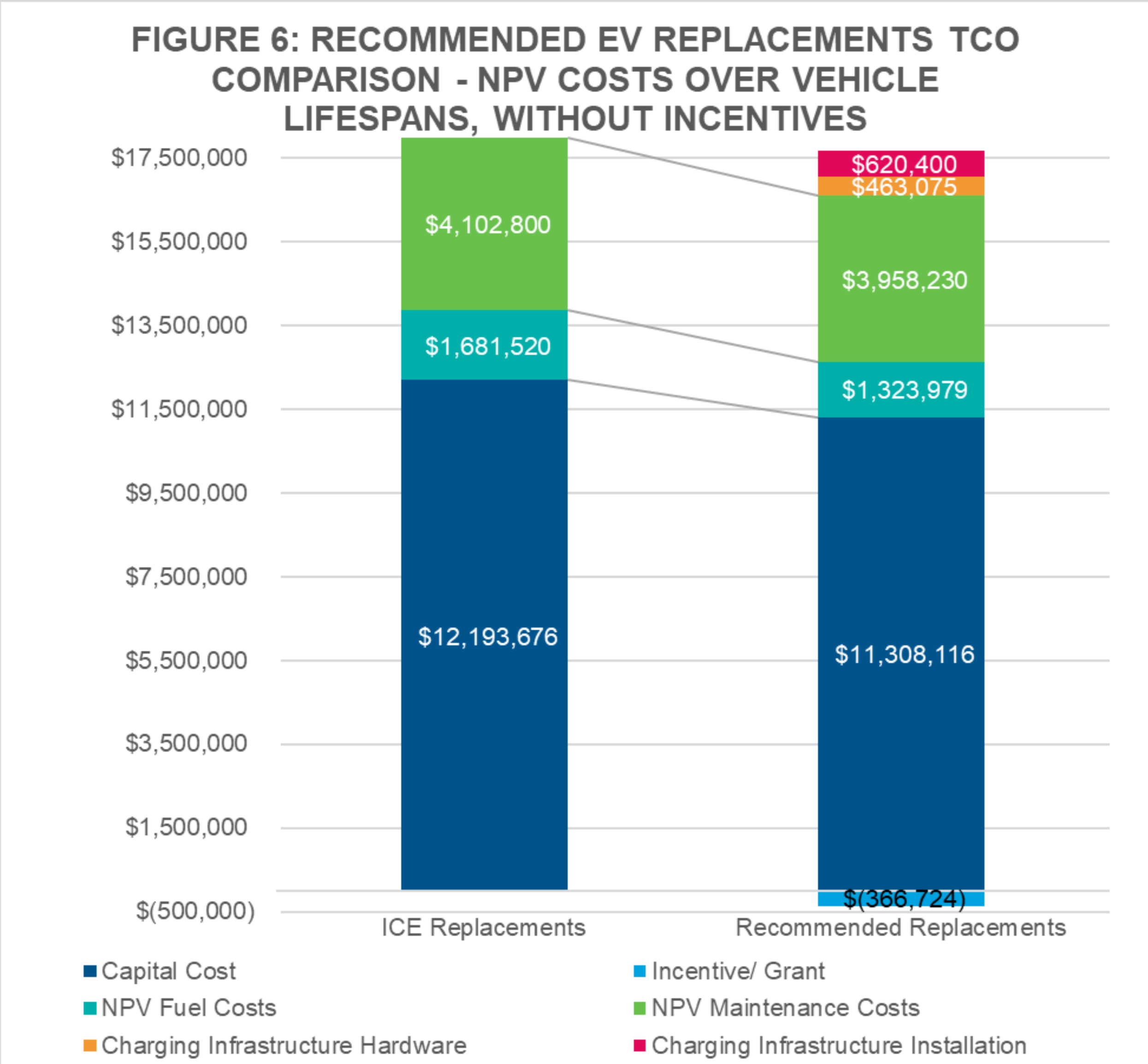
FIGURE 5: EV MODEL AVAILABILITY BY VEHICLE TYPES - TOTAL IN MARKET



VI. Economic Analysis

To determine the TCO, the vehicle lifespans of the 61 vehicles suggested for electrification was evaluated. The incremental electric vehicle supply equipment (EVSE) needed to charge these vehicles, the assumed cost of EVSE purchase, installation, and grant opportunities were included in TCO calculations.

These assumptions include installing Level 2 and direct-current fast charging (DCFC) EVSE charging stations. Figure 6 includes the cost of all 61 EVs and EVSE over the entire vehicle lifespans compared to the traditional ICE vehicle replacement.



The EV replacement TCO is further lowered by available EV and EVSE incentives for government fleets, based on currently available incentives. The TCO of replacing 20 vehicles with EVs is shown below, in Figure 7.

Please see U.S. Department of Energy's (DOE) Alternative Fuels Data Center for all currently available Maryland and Federal EV and EVSE incentives. Information is also available at MarylandEV.org.

FIGURE 7: RECOMMENDED EV REPLACEMENTS TCO COMPARISON - NPV COSTS OVER VEHICLE LIFESPANS, WITHOUT INCENTIVES

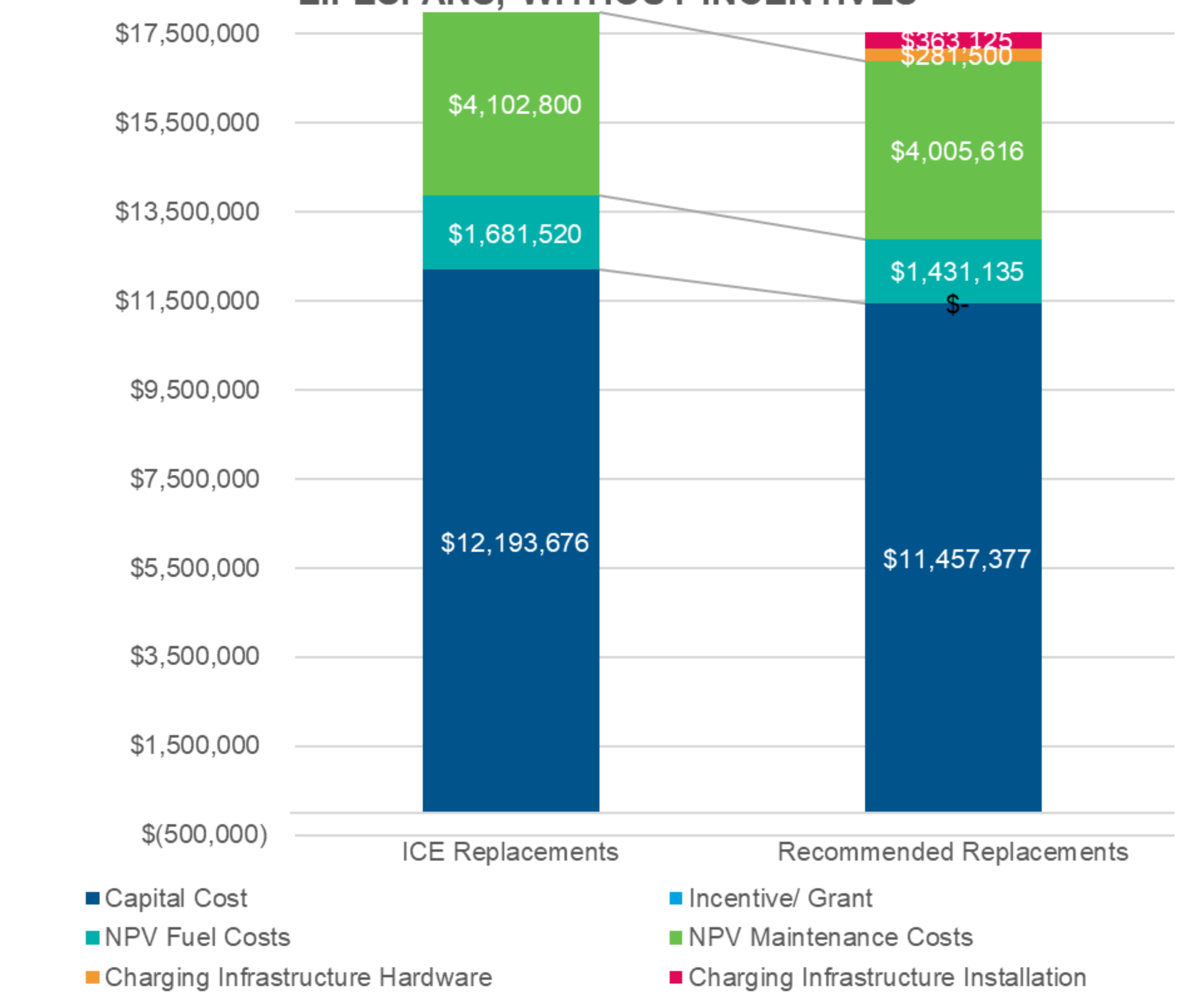


Table 3 provides a breakdown of the assumptions made in TCO modeling, to allocate EVs and EVSE plugs. Using Table 3 as a potential guide can help Rockville strategically plan EVSE installation to limit infrastructure costs. Depending on vehicle duty cycle, more or less vehicles could charge per plug. If vehicles are fully rotated throughout the day, less plugs may be needed, while more plugs may be needed for vehicles on the same duty cycle which need to charge simultaneously. See the DOE Alternative Fuels Data Center for more information about Charging Infrastructure Procurement and Installation, including average costs.

Fleet advisory services provided by ICF

TABLE 3. NUMBER OF EVS PER EVSE PLUG

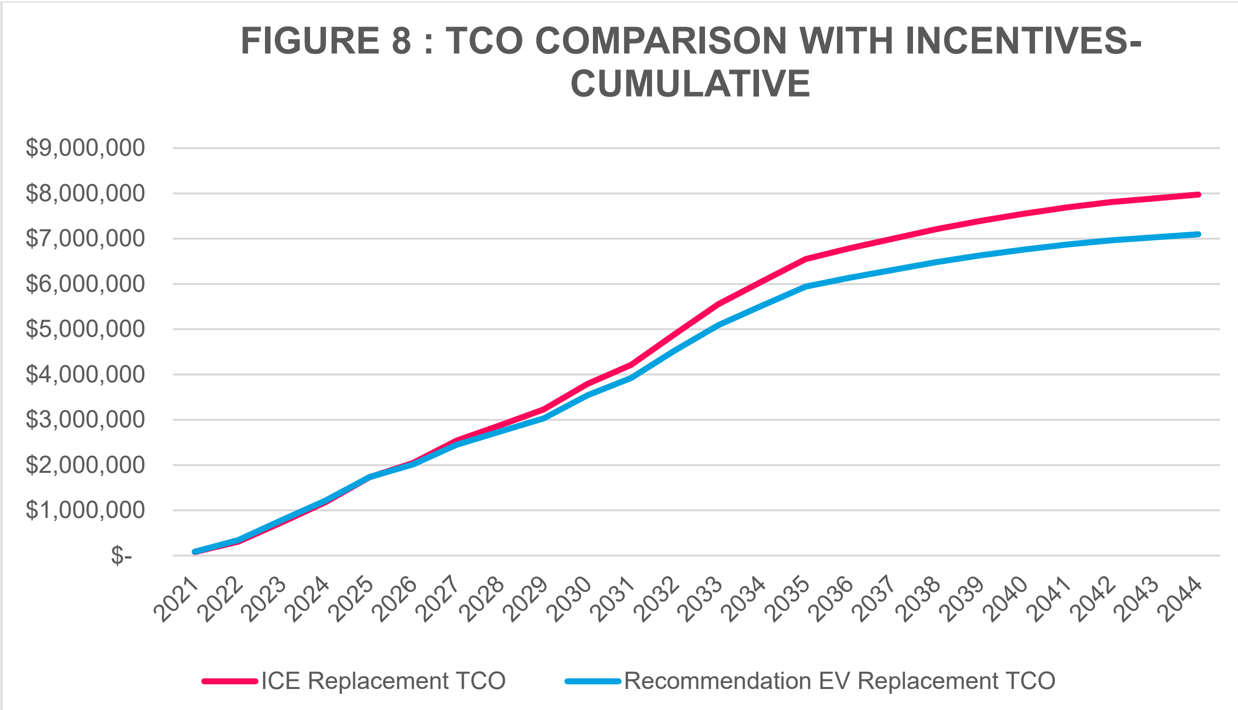
Vehicle Type	Sub Type	EVs per Plug	Charger Level
Sedan	Sedan	2	L2
Sedan	Sedan - Police	2	DCFC
Minivan	Minivan	2	L2
SUV	SUV	2	L2
Light-Duty Pickup	Light-Duty Pickup	2	L2
Medium-Duty Pickup	Medium-Duty Pickup	4	DCFC
Van	Van	4	DCFC
Step Van	Step Van	4	DCFC
Medium-Duty Vocational Truck	Medium-Duty Vocational Truck	4	DCFC
Box Truck	Box Truck	2	DCFC
Street Sweeper	Street Sweeper	2	DCFC
Refuse Truck	Refuse Truck	2	DCFC
Shuttle Bus	Shuttle Bus	2	DCFC
Transit Bus	Transit Bus	1	DCFC
Bucket Truck	Bucket Truck	2	DCFC
Dump Truck	Dump Truck	2	DCFC
Heavy Truck	Heavy Truck	2	DCFC

Different vehicle types are responsible for different average electrification TCO savings. As Rockville believed, the light-duty vehicle leases are not the best opportunity to capitalize on electrification savings, due to their low mileage. Heavy-duty vehicles, such as shuttle buses and refuse trucks, are the most cost-effective electrification solutions, largely due to their mileage and fuel consumption. If Rockville is able to receive incentives such as the MEA Clean Fuel Incentive Program which was available in 2021, then additional vehicle types are also financially beneficial for electrification, as shown in Table 4, below.

TABLE 4. AVERAGE TCO SAVINGS PER EACH VEHICLE TYPE, WITH INCENTIVES

Vehicle Types	TCO Savings
Sedan	$199
SUV	$585
Light-Duty Pickup	$660
Van	$2,384
Shuttle Bus	$22,716
Refuse Truck	$34,228
Heavy Truck	$14,253

As vehicle lifespans extend beyond 2035, TCO calculations extend out to 2050. The TCO comparisons in Figures 8 TO 11 show that TCO savings will almost always be realized annually, but will fluctuate based on the suggested electrification schedule in Figure 4. As capital expenditure is spread across leases for some vehicles, yet presented as initial purchase costs for other vehicles and EVSE, the years following 2027 will all provide operational savings.



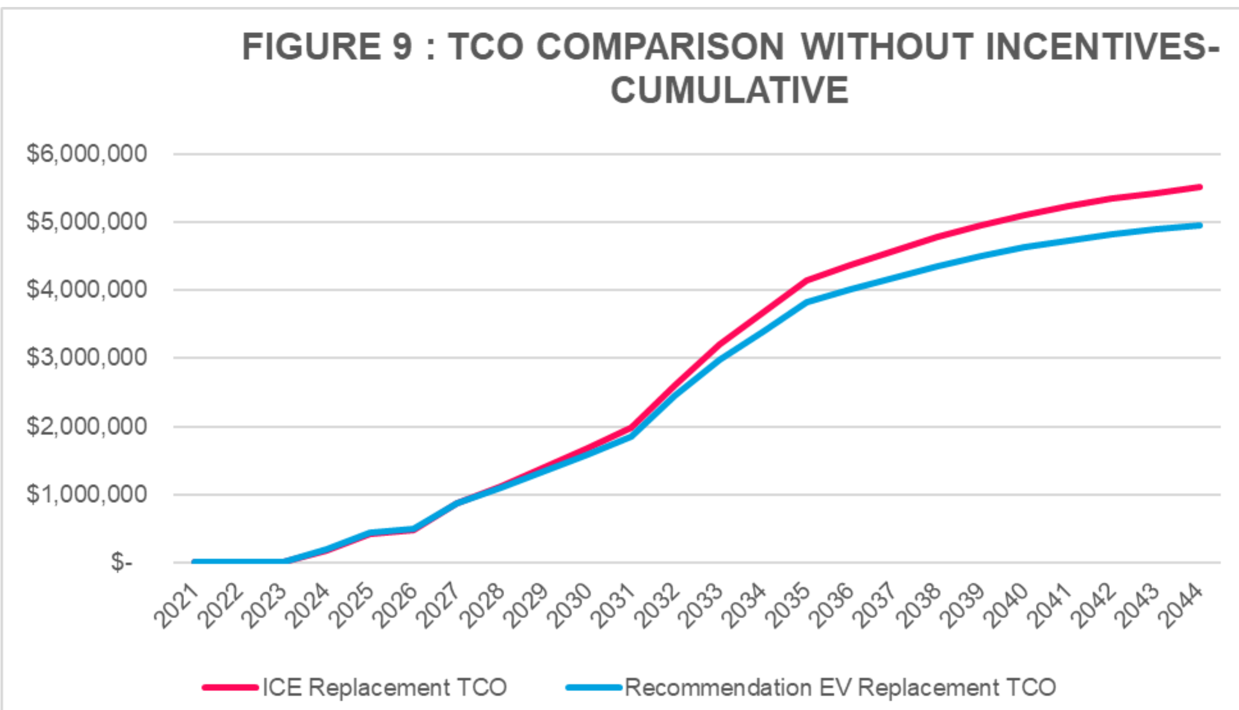


FIGURE 10: TCO COMPARISON WITHOUT INCENTIVES- ANNUAL

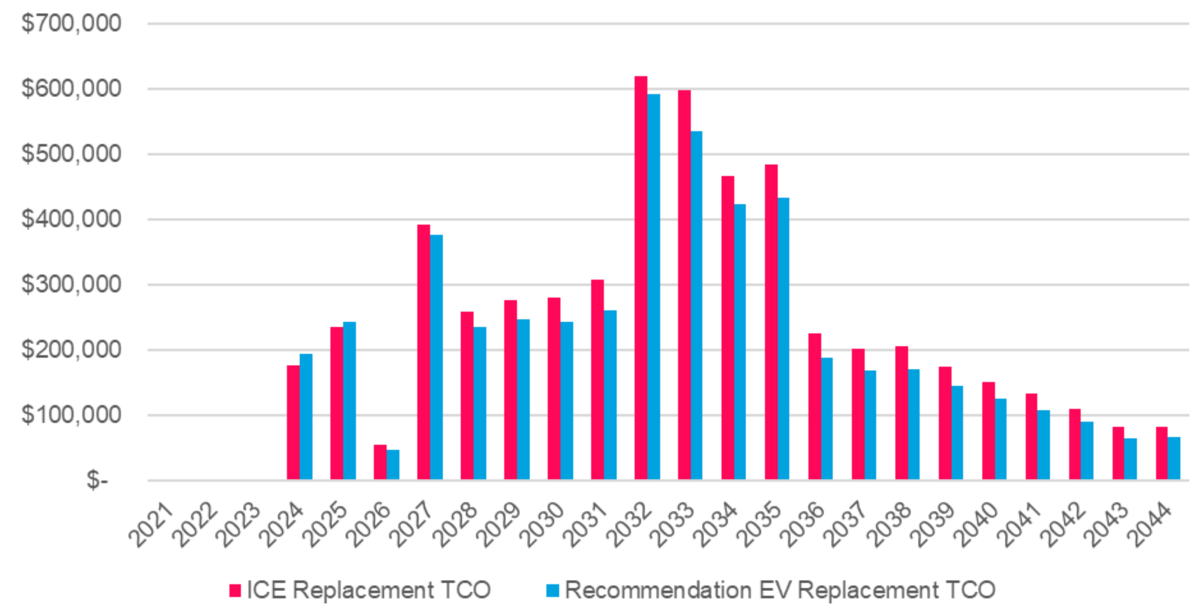
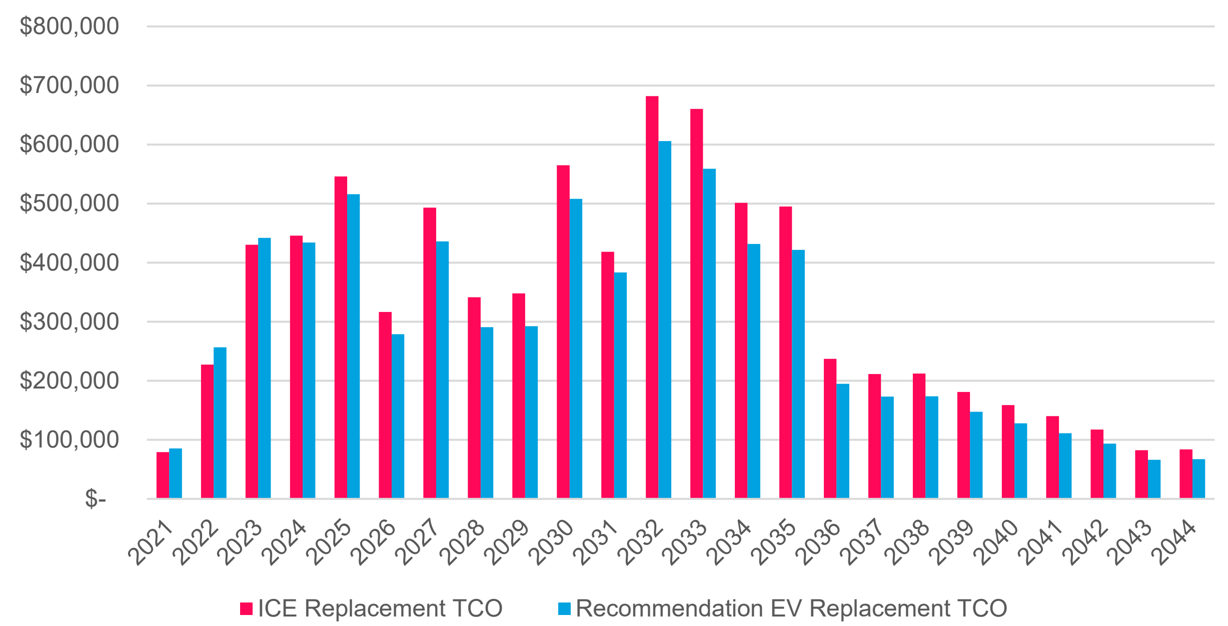


FIGURE 11: TCO COMPARISON WITH INCENTIVES- ANNUAL



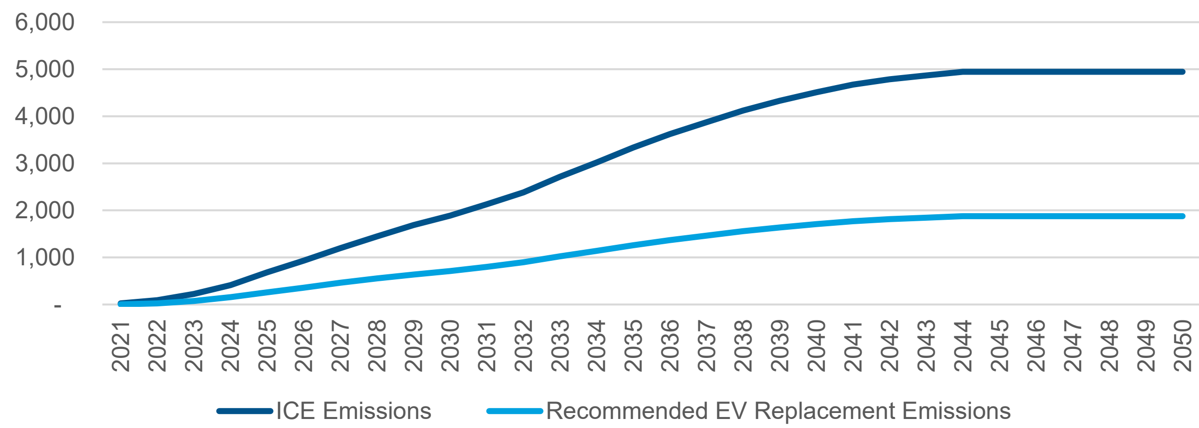
This report estimates the payback period, with incentives, for purchase fleet electrification to end in 2044 and leased vehicles to end after the 5-year lease cycle. However, the length of the payback period can be significantly influenced by the amount of financial incentives Rockville secures. The more funding the City is able to obtain for EVs and EVSE, the shorter the payback period.

Many vehicles not recommended for electrification by 2035 will likely become eligible for electrification beyond 2035. As new makes and models become available, technology develops, and the first round of EVs reach the end of their payback period, the next round of vehicles eligible for electrification will likely be more accessible and affordable.

VII. Emissions Analysis

Improvements in vehicle fuel economy and technologies, have provided small, incremental vehicle emissions savings over the years, however conversion to EVs will provide a significant and immediate emissions savings. Converting 61 ICE vehicles to EVs would save Rockville 3,068 metric tons of GHG emissions over the lifespan of all converted EVs, through 2050. Additionally, 3 metric tons of NOx will be reduced over the vehicle lifespan. Figure 12, below, shows the emissions trajectory of the replacement with new ICE vehicles versus the replacement with EVs. This includes factoring in the petroleum fuel reductions, offset by a potential electricity consumption increase.

FIGURE 12: CUMULATIVE FLEET GHG EMISSIONS (MT) FOR 61 EVS



These calculations are for wheel-to-well emissions, balancing the gasoline and diesel emissions savings with the emissions created to produce electricity, based on the Rockville grid generation mix. Estimated lifetime emissions savings per vehicle type for the 61 vehicles is available below, in Table 5. Actual emissions per vehicle can vary dramatically based on the vehicle being replaced and average mileage.

TABLE 5. LIFETIME EMISSIONS SAVINGS PER VEHICLE TYPE, FOR 61 VEHICLES

Vehicle Types	NOX Emission Reductions (MT)	GHG Emission Reductions (MT)
Sedan	0.0020	14
SUV	0.0143	134
Light-Duty Pickup	0.0216	126
Van	0.7891	163
Shuttle Bus	0.4775	2,540
Refuse Truck	1.3693	2,144
Heavy Truck	0.5054	263
Total	**3.18**	**3,068**

VIII. Conclusion

This analysis identifies 20 to 61 vehicles for electrification in Rockville's fleet over the next 15 years. If Rockville follows the recommended replacement schedule for transitioning from ICE vehicles to EVs, the City can expect to see operational savings following 2027 and a reduction in GHG emissions up to 3,068 metric tons.

As Rockville begins electrifying its fleet, it should anticipate certain barriers and challenges. The largest barrier that fleets can face when electrifying their fleet is the cost of acquiring EVs and building charging infrastructure. To help minimize the incremental cost of acquiring EVs and realize all potential cost savings of fleet electrification, Rockville should apply for grant and funding opportunities. While funding availability is not guaranteed, Rockville should consider applying for the following financial incentives offered in Maryland:

- Clean Fuel Incentive Program (CFIP) for EVs and Charging Stations
- EVSE Workplace Charging Grant
- EVSE Rebate Program
- Maryland Smart Energy Communities (MSEC)

Incentives available to local governments in Maryland include funding from MEA, Volkswagen Settlement Funds, and potentially future federal funding. When applying for grant funding, the City needs to be strategic as some funding opportunities cannot be combined with others. For example, Volkswagen Settlement funds are distributed by the Maryland Department of the Environment and cannot be combined with other Maryland-based funding opportunities. While the City can apply for all funding opportunities, it should consider the implications of having to potentially choose between awards. Similarly, the City should monitor federal activity for new EV and EVSE incentives that are anticipated to be released.

The City can also partner with Pepco to pursue public charging stations, however these are not intended for the fleet. Similarly, to realize the lower fuel costs of EVs compared to ICE vehicles, Rockville should monitor their electricity use to ensure charging occurs during off-peak hours.

Along with the cost of vehicle acquisition, range anxiety can present barriers to EV users. To familiarize individuals in charge of operating and maintaining

EVs and EVSE, Rockville can use the following sampling of EV resources to develop educational materials:

- Maryland EV
- DOE Alternative Fuels Data Center's Electricity Basics
- DOE Alternative Fuels Data Center's Developing Infrastructure to Charge Plug-In Electric Vehicles
- DOE's Electric-Drive Vehicles report
- DOE's fueleconomy.gov website for all vehicle models available
- SemaConnect's Basics About Charging Stations
- CALSTART's Zero-Emission Technology Inventory (ZETI) tool
- National Alternative Fuels Training Consortium's Electric Drive Vehicle Automotive Technician Training

To ensure Rockville is prepared for fleet electrification, the City should follow these recommended next steps:

- Identify and apply for relevant grant funding opportunities to help offset the cost of EV purchases and EVSE construction
- Begin implementing the recommended vehicle replacement schedule into the fleet vehicle acquisition plan
- Develop EV and EVSE usage training for drivers
- Develop fleet and facilities maintenance training for all employees responsible for driving or maintaining an EV or EVSE
- Determine where EVs will be housed overnight
- Begin a siting analysis to identify potential EVSE installation locations

IX. Appendices

Appendix 1: Vehicle Replacement Assumptions

**Note: These are vehicles used for comparison purpose, not an endorsement of any individual EV manufacturer or model. See DOE's fueleconomy.gov website for all vehicle models available*

Appendix redacted.

Appendix 2: Assumptions and Calculations

Key assumptions and data sources that were used in this analysis include the following:

- **Recommendation Threshold:** EVs are recommended only when the EV TCO is less than the TCO of the comparable internal combustion engine (ICE) vehicle.

- **Vehicle Pricing:** The model uses manufacturer suggested retail prices (MSRPs) for EVs where available. When MSRP pricing is unavailable, the model uses average pricing based on vehicle and fuel type based on Argonne National Laboratory's Alternative Fuel Life Cycle Environmental and Economic Transportation (AFLEET) Tool and ICF's *Comparison of Medium- and Heavy-Duty Technologies in California* report for the California Electric Transportation Coalition. Vehicle pricing was escalated annually using the U.S. Energy Information Administration's (EIA) 2020 Annual Energy Outlook (AEO) and ICF's *Comparison of Medium- and Heavy-Duty Technologies in California* report for the California Electric Transportation Coalition. The model assumes a combination of owned and lease vehicles. Lease vehicle prices were based as a payment function of the 5-year lease, represented as PMT (rate, nper, pv, [fv], [type]) =PMT (4%, .33%, MSRP, (5 year lease/vehicle useful life)

- **Annual Mileage:** The City of Rockville provided mileage estimates to utilize.

- **Fuel Costs:** The existing fleet fuel costs were estimated using the vehicles' annual mileage, AFLEET fuel economy assumptions by vehicle and fuel type, and base fuel prices per gallon. The model uses $2.10 per gallon of diesel and $1.98 per gallon of gasoline rates, as provided by the City of Rockville. The model escalates gasoline and diesel pricing annually using projections from the U.S. EIA's 2020 AEO Reference Case for Transportation.

- **Maintenance Costs:** Existing fleet maintenance costs were estimated using AFLEET dollar per mile assumptions by vehicle type and by fuel type. Maintenance costs were escalated 2% annually. Additional maintenance savings for EVs may be realized over time, however an initial capital outlay is needed to train maintenance staff and adjust operations to handle EVs.

- **Electricity Pricing:** The model uses $0.13/kWh base rate, as provided by the City of Rockville.

- **Vehicle Replacements:** The City of Rockville provided vehicle replacement estimates to utilize.

- **Timeframe:** Based on the vehicle retirement schedule, this analysis focuses on vehicle replacements for 2021 through 2035, with TCO calculations extending out to 2050 to capture entirety of vehicle lifespans.

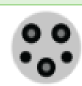
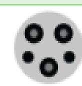
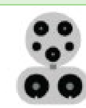
- **Discount Rate:** 5% was used for net present value (NPV) calculations.

- **Temperatures:** Utilized the average annual Rockville temperatures to calculate the impact on battery performance and reduced battery range.

Appendix 3: EVSE Overview

The U.S. Department of Energy National Renewable Energy Lab [Alternative Fuel Data Center](#) offers resources to better understand EVSE and infrastructure requirements. The following information is a primer of some of the resources available:

EVSE Charging Types

	Level 1 Alternating Current	Level 2 Alternating Current	DC Fast Charging		
Description	Uses a standard plug - 120 volt (V), single phase service with a three-prong electrical outlet at 15-20 amperage (A)	Used for both battery electric (BEV) and plug-in hybrid electric vehicle (PHEV) charging 208/240 V AC split phase service that is less than or equal to 80 A.	Used specifically for battery electric vehicle charging Typically requires a dedicated circuit of 20-100 A, with a 480 V service connection.		
Connector type(s)					
	J1772 charge port	J1772 charge port	J1772 combo	CHAdeMO	Tesla combo
Use	Residential or workplace charging	Residential, workplace, or public charging	Rapid charging for transportation depots, vehicle fleets, public corridors		
Limitations	Low power delivery lengthens charging time	Requires additional infrastructure and wiring	Can only be used by BEVs currently. Higher upfront and operational costs		
Time to charge	2 to 5-mi range/1-hr charging Depending on the vehicle battery size, PHEVs can be fully charged in 2-7 hours and BEVs in 14-20+ hours	10 to 25-miles range/1-hr charging Depending on the vehicle battery size, PHEVs can be fully charged in 1-3 hours and BEVs in 4-8 hours	50 to 70-mi range/20-min charging Depending on the vehicle battery size, BEVs can be fully charged in 30-60 minutes.		

Methodology for Determining Fleet EVSE Needs

Step	Description	Calculation
1. Determine Individual Vehicle Energy Use	For each vehicle, determine its expected energy use in kilowatt-hours (kWh) by multiplying the vehicle's energy efficiency (kWh/mile) by the expected vehicle miles traveled (VMT) between charges.	Vehicle Energy Use (kWh) = Vehicle Energy Efficiency (kWh/mile) * VMT (mile)
2. Determine Fleet Energy Use	For each vehicle that requires charging within a certain window, sum their individual energy use requirements.	Fleet Energy Use (kWh) = $\sum$ Vehicle Energy Use_1 + Vehicle Energy Use_2 + … + Vehicle Energy Use_n

3. Identify Daily Charging Window	Identify the period of time that fleet vehicles are available to charge (e.g. 10 p.m.- 6 a.m.).	Hours (hr)
4. Identify Average Charging Demand	Divide fleet energy use by the charging window to determine average kilowatts (kW) of charging needed for truck operations.	Average Charging Demand (kW) = Fleet Energy Use also as kWh
5. Determine Average Per Vehicle Charging Demand	Divide average charging demand by the number of vehicles that require charging	Vehicle Charging Demand (kW) = Average Charging Demand (kW) / Vehicles

Appendix 4: Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool

The analysis contained within this report used assumptions and data contained within Argonne National Laboratory's (ANL) AFLEET Tool as the basis for comparison. For additional analysis, the AFLEET Tool may be used to examine the environmental and economic costs and benefits of alternative fuel and advanced vehicle technologies. AFLEET allows users to estimate vehicle and fleet petroleum use, GHG and air pollutant emissions, and TCO for light-, medium-, and heavy-duty vehicles. The tool relies on data from ANL's Greenhouse gases, Regulated Emissions, and Energy use in Technologies (GREET) model and the Environmental Protection Agency's Motor Vehicle Emission Simulator (MOVES) model..

Resources for the AFLEET Tool may be found at the following locations:

- AFLEET Tool Online
- AFLEET Tool 2020 Spreadsheet
- User Guide for the 2020 AFLEET Tool