



MEMORANDUM

TO: Joint Budget Committee, Senate Transportation Committee, and House Transportation & Energy Committee

FROM: Tony Gherardini, Executive Director, Department of Personnel & Administration

DATE: November 1, 2023

RE: State Fleet Vehicle Acquisition Report - Fiscal Year 2022-23

This *State Fleet Vehicle Acquisitions* report is submitted pursuant to 24-30-1104 (2)(c)(II), C.R.S. and 24-30-1104 (2)(c)(V), C.R.S. The report highlights the Department of Personnel & Administration's (Department) efforts to increase Alternative Fuel Vehicles (AFV) in the State Fleet. This effort is supported by state agencies, policies, and statute.

Colorado statute directs the Department to “adopt a policy to significantly increase the utilization of alternative fuels and that establishes increasing utilization objectives for each following year.” 24-30-1104 (2)(c)(II), C.R.S. requires the Department to purchase plug-in hybrid electric vehicles (PHEV), battery electric vehicles (BEV), compressed natural gas vehicles (CNG), or other alternative fuel vehicles if either the increased base cost or the increased life-cycle cost of the vehicle is not more than 10% over the cost of a comparable dedicated petroleum fuel vehicle. If the purchase of an Alternative Fuel Vehicle (AFV) is not below the 10% mandate, the Department will recommend the purchase of the most applicable AFV to the assigned agency based on Executive Order directives for the adoption of low emission vehicle deployments.

State Fleet Management (SFM) collaborates with each agency to maximize the use of AFV in the State's fleet and to ensure each replacement vehicle can perform adequately in the field. In the event that an agency cannot adopt any available AFV option, the Executive Director of the agency must submit documentation supporting the justification of noncompliance with AFV mandates. This documentation is reviewed by the Department and the Colorado Energy Office (CEO) for approval.





SUMMARY OF FISCAL YEAR 2023 VEHICLE ACQUISITIONS

SFM worked with state agencies, local governments, and the private sector across Colorado to find creative solutions and products that provide agencies with flexibility and responsive solutions while allowing State Fleet Management to adopt new, innovative vehicle solutions to support AFV requirements. The following summary highlights these efforts.

Battery Electric & Plug-In Hybrid Electric Vehicles

In partnership with National Renewable Energy Laboratories (NREL), the State conducted utilization of vehicle electrification studies between FY18 and FY23. This resulted in the development of technology and data generation to better understand the most efficient adoption of electric vehicles. The studies used telematics devices pre-installed on the vehicles. As a result, two key hurdles to successful EV implementation were identified: (1) the need for information on vehicle operational areas and its use to target effective electrification opportunities, and (2) the need for charging infrastructure, particularly where the vehicle is stored when not in use.

Based on the State's studies, telematics has been installed on more than 4,000 state vehicles by the end of FY2022-23. Telematics are slated for expansion by 25% (1,575) of state vehicles in FY 2023-24. The expansion of telematics will be used to review the fleet more broadly for efficiency and safety measures. This will directly allow for the review of electric vehicle expansion opportunities and petroleum reduction in general.

These efforts have already resulted in the expansion of Plug-In Electric Hybrid Vehicle purchases. The Department purchased 8 PHEVs in FY 2022-23, representing 2% of fleet purchases. PHEVs, powered by both an internal combustion engine and an electric motor that uses the electricity stored in the vehicle's battery, are a good purchase opportunity to help bridge the gap between current petroleum-consuming vehicles and the future expansion of vehicle electrification. To maximize the positive impact of the PHEV technology efficiencies, the operators must consistently charge overnight to ensure that PHEV batteries are charged and ready for use the following day.





Battery Electric Vehicles (BEV) currently have technology and production limitations, but with increased adoption and demand, manufacturers are increasing production of capable products. Advances in technology and reductions in cost should make BEVs more attainable. Currently, the main limitation to a broader deployment is vehicle charging infrastructure. Nonetheless, the state purchased 42 BEVs representing 10.47% of fleet orders in FY 2022-23.

Compressed Natural Gas

For many years, the Department experienced challenges with respect to the fact that CNG vehicle costs generally exceed the 10% threshold, and fewer CNG vehicles are offered by manufacturers. In addition, the State's vehicle ordering timeline continues to be a challenge in aligning with AFV grant funding opportunities. Due to the significant additional equipment costs, and limited grant funding to offset the CNG vehicle purchase price, procurement of CNG powered vehicles continues to be a challenge.

In FY 2022-23, the Department placed no orders for CNG vehicles. Infrastructure expansion was flat during the fiscal year, and industry indicators point to CNG displacing less than 1% of the vehicles within the light duty marketplace in the coming years. The trend is bolstered by underdevelopment of CNG vehicle repair facilities and a limited number of fueling sites throughout the State.

Hybrid Vehicles

Hybrid vehicles continue to be a viable option for many operational agencies. In FY 2022-23, SFM ordered 65 hybrid vehicles. This represents 16.21% of all vehicle orders. The comparable life-cycle cost on hybrid models was less than 10% compared to their gasoline equivalents. As hybrid vehicle platforms have become more commonplace, associated costs have decreased, on-board technology has become more efficient, and overall, they reduce the State's carbon footprint.

Flexible Fuel Vehicles

The Department placed orders for 72 E85 Flexible Fuel Vehicles (FFV). This represents 17.96% of all vehicle orders. The cost of fuel and equipment to outfit vehicles for E85 is less than 10% of comparable standard petroleum vehicles. While E85 fuel has been an inexpensive fuel,





industry trends and announcements from vehicle manufactures have marked a movement away from E-85. Specifically, manufacturers are reducing the availability of models with this capability. This continues to be an area of change in the market as many of these vehicles have been replaced with hybrid platform vehicles, including hybrid trucks.

Petroleum Vehicles

The Department ordered 214 dedicated petroleum vehicles this year, representing 53.37% of all vehicle orders. 199 were gasoline, and 15 were diesel vehicles. Respectively, this represented 49.63% and 3.74% of all vehicle orders. The diesel powertrain has become a specialized ordering item due to the high added cost of initial purchase and a lower average rate of return on investment. Three fourths of petroleum vehicles (165) ordered in FY 2022-23 were for the Colorado Department of Public Safety (CDPS).

DPA PROCEDURES & POLICIES ON ORDERING NEW VEHICLES

SFM depends on the collaboration of all State agencies and the Governor's Office to fulfill its mission. SFM also has partnerships with both the Motor Vehicle Advisory Council (MVAC) and Greening and Government Leadership Council (GGLC) to support AFV deployment.

The Department's vehicle ordering process is governed by 24-30-1104, C.R.S. and [Executive Orders](#). Between 2017 and 2022, successive Governors executed initiatives (E.O. D 2017-015, B 2018-006, D 2018-026, B 2019-002, D 2019-016, D 2022-016) to focus efforts on reducing greenhouse gas (GHG) emissions from transportation sources through alternative vehicle fuels. These directives have put additional focus on Zero Emission Vehicle (ZEV) technologies to achieve these goals.

As stated above, statute requires the Department to purchase AFV-capable vehicles whenever the base cost or life-cycle cost for the AFV is within 10% of the cost of the regular gasoline alternative. This allows the State to take advantage of Colorado's vast reserves of natural resources, reduce our dependence on petroleum, create new jobs, and reduce our carbon footprint.

The ordering process emphasizes a menu approach for appropriate vehicle selection. As there is a vast array of job duties required of the State's vehicle fleet, a menu approach allows





agencies to identify the correct AFV available for their needs. SFM also produced documentation that guides agencies through the selection process so the most effective vehicle can be purchased and put into service.

AFV models must be reviewed and considered as the first choice during the vehicle selection process. If it is determined that the AFV models available for purchase such as PHEV, BEV, or Hybrid will not meet the functional requirements of the department, the agency will review all vehicle options, and another type of alternative fueled vehicle such as CNG or E85 will be selected. The last option will be to purchase a gasoline or diesel petroleum vehicle. If the available proposed AFV model will not work for the department, an additional form “Non-AFV Purchase Justification Form” must be completed and signed by the Executive Director of each agency requesting the vehicle.

INFRASTRUCTURE STRATEGY

SFM partners with the CEO, the U.S. Department of Energy’s Clean Cities Coalition, Regional Air Quality Council, National Renewable Energy Laboratory, political subdivisions, representatives from alternative fuel suppliers, EV charging suppliers, infrastructure manufacturers, and property developers to foster best practices and strategies to develop AFV infrastructure statewide.

Alternative fuel vehicles have traditionally created unique challenges, requiring that there are adequate concentrations of AFV vehicles in place at, or near, fueling sites. With the increase of available electric vehicles, it is imperative that charging infrastructure be placed at facilities where vehicles are located. In some cases, this includes placing charging infrastructure in the homes of State employees who are issued State-owned EVs. Additionally, cooperative processes must be developed between the private sector and federal, state, or local government agencies to help increase the number of public charging stations.

Cooperating with other governments and private organizations ensures that State agencies can meet the requirements of EV operation, including access to charging at an overnight storage location and while on the road. The State of Colorado has set an example for other governments and private fleets by purchasing EVs, working closely with the CEO, and coordinating the distribution and use of EVs across all departments. SFM will continue to





provide thorough guidance on the placement of AFVs in tandem with other public and private fleets to support Colorado’s burgeoning alternative fuel and charging market.

In 2021, Governor Polis signed SB21-260, creating the Community Access Enterprise. The same year, Congress created the National Electric Vehicle Infrastructure Program. These two funding sources will be critical to creating a robust charging network across Colorado that includes charging stations in communities and along major transportation corridors.

Working closely with State agencies and the CEO, SFM provides guidance on the proper placement of these vehicles and additional charging equipment to maximize successful deployment. FY 2022-23 realized the largest deployment of BEVs (42) in service in the State's fleet history. This is a direct result of the Governor's Executive Order and subsequent directive memos instructing agencies to prioritize the procurement and utilization of electric vehicles. This trend will continue throughout the next decade as the government continues the transition to low carbon fuels.

CEO leads agency efforts to build charging infrastructure. The CEO develops grant programs that incentivize installation of electric vehicle charging stations across the State. In 2021, Governor Polis signed legislation providing the CEO with \$5 million to allocate among the agencies to build out charging infrastructure. The CEO developed a needs assessment and worked with agencies to identify locations for new charging stations. Nearly 70 stations have been installed through FY 2022-23, and it is expected that more than 200 stations will be installed as a result of this funding. The Office of the State Controller has issued an EV Take Home Policy, and the CEO is also working with SFM and agencies to implement this policy allowing employees to charge State-owned vehicles at home and be reimbursed for the electricity.

AVAILABILITY OF AFV INFRASTRUCTURE STATEWIDE

Infrastructure remains a critical hurdle to influencing the adoption of alternative fuels. Public and private entities are taking steps to address the infrastructure gap. Private station developers like Electrify America and EVgo have built a number of high-speed charging





stations along Colorado’s interstates while also installing charging in and around the Metro-Denver area.

In 2019, CEO made an award to install high-speed charging stations at 34 locations across Colorado’s major transportation corridors. Currently 31 stations are operational, with all scheduled to be installed by early 2024.

The Public Utilities Commission approved Xcel Energy’s \$110 million Transportation Electrification Plan in early 2021, which will result in significant investment in the utility’s territory. State agencies are eligible to participate in Xcel’s EV Supply Infrastructure program and EV rebate programs, which should reduce the costs for installing charging stations at State facilities in Xcel’s territory.

EXEMPTIONS

SFM is required by statute to purchase an alternative fuel vehicle if either the increased base cost of such vehicle or the increased life-cycle cost of such vehicle is not more than 10% over the cost of a comparable dedicated petroleum fuel vehicle. The Department’s Executive Director is required to adopt a policy to allow some vehicles to be exempted from this requirement. Current exemptions include:

- CDPS law enforcement patrol, undercover, and specialized vehicles, as well as crime scene labs and hazardous materials vehicles are exempted from this requirement until such time AFV vehicles are available and law enforcement pursuit certified. However, CDPS is required to purchase AFV vehicles wherever practicable except for the exemptions listed above. Note: Currently there are no “pursuit”-rated CNG models available for patrol vehicles from the manufacturer, and only this model year 2024 did a “pursuit” rate EV come to market. This “pursuit” rating is a standard of the Colorado State Patrol (CSP) to perform the required task. The State Patrol purchased the Ford Mustang Mach E to evaluate viability as a patrol vehicle with limited success. The first pursuit rated EV is the Blazer EV produced by Chevrolet. Colorado State Patrol has plans to purchase two of these units for pilot testing as well.





- Non-CDPS law enforcement “certified patrol” vehicles used by State agencies are exempt from this requirement until such time as AFV vehicles are available and proven reliable and certified for this function. At this time, these models will include the Police Dodge Durango, Chevy Police Tahoe, Ford Police Expedition, and Interceptor Utility.
- Vehicles that have specialized equipment that makes them less suitable for general transportation may also be exempted. These vehicles are essentially a “tool on wheels” or “mobile shop” that would be difficult to accommodate large additional fuel tank and battery storage configurations and be certified by the OEM. Examples include a drilling unit, water tanks, lab/research equipment, plumbing or telecommunications equipment, and patient and prisoner transport vehicles.
- Other potential exemptions will be considered on a case-by-case basis only through a cooperative review established between CEO and the Department. Currently, final signature authority for Non-EV purchases rests with the Governor’s office.

The table below identifies the number of acquisitions by fuel type configuration or hybrid vehicles by agency for FY 2022-23.





FY2022-23 Acquisitions by Department and Fuel/Hybrid Type								
Department	AFV					NON-AFV		Total by Department
	CNG	E85	Hybrid	PHEV	BEV	Diesel	Gasoline	
CDPS	0	2	18	0	3	4	161	188
CDA	0	1	2	0	2	0	0	5
CDOC	0	22	0	5	11	0	0	38
CDE	0	1	0	0	0	0	0	1
CDPHE	0	0	0	0	2	0	1	3
CDHE	0	8	2	0	0	5	3	18
CDHS	0	2	0	2	1	0	3	8
LAW	0	0	1	0	1	0	0	2
DEC	0	0	0	0	0	0	0	0
DOLA	0	0	0	0	0	0	0	0
CDLE	0	1	0	0	2	0	1	4
DMVA	0	1	0	0	0	0	0	1
DNR	0	31	18	0	11	6	29	95
DOR	0	0	6	1	0	0	0	7
DORA	0	0	5	0	0	0	0	5
SOS	0	0	0	0	0	0	0	0
CDOT	0	3	9	0	4	0	1	17
GOV	0	0	0	0	0	0	0	0
DPA	0	0	0	0	5	0	0	5
JUD	0	0	4	0	0	0	0	4
Total Acquisitions	0	72	65	8	42	15	199	401
Percent of Total	0.00%	17.96%	16.21%	2.00%	10.47%	3.74%	49.63%	100.00%

AFV VEHICLE ACQUISITIONS - FY 2007-08 to FY 2022-23

Since January 2008, Colorado has been committed to purchasing AFVs available in the marketplace. Fueling infrastructure continues to be a major hurdle as noted above. Additionally, budget constraints can adversely impact the investment in emerging technologies. For example, the economic crash in FY 2008-09 resulted in the State only approving vehicles to be replaced in FY 2010-11 and FY 2011-12 if they had an impact on life, health, or safety. Most of these vehicles were for the CDPS State Patrol Division with limited AFV opportunity - the majority being E-85 and Hybrid. Broader AFV acquisitions resumed in FY 2012-13. See the table below for a summary of vehicle acquisitions from FY 2007-08 to FY 2018-19. This is a point in time report, and variations are expected year over year.





From FY 2007-08 to FY 2022-23, the SFM Program was able to purchase a total of 5,057 alternative fuel vehicles capable of reducing significant quantities of petroleum. E-85 has seen a reduction as an option because of a reduction in fuel infrastructure as well as a reduced number of vehicle options due to the rise of more efficient Hybrid, PHEV, and BEV options.

As previously stated, the industry has made a significant effort to expand vehicle electrification. That has led to more applications, a broader spectrum of choices, and overall economies of scale. Overall, this shift in the market has allowed the State to purchase 1,559 hybrid vehicles between FY 2007-08 and FY 2022-23.

The PHEV platform is also showing continued growth with a total of 276 vehicles purchased between FY 2007-08 and FY 2022-23. The 76 BEV purchases have been a concisely-focused effort using lessons learned from previous AFV rollouts to identify current State-owned infrastructure and then reviewing the utilization patterns through telematics prior to procurement. This measured approach based on telematics data will help to create strong use cases as EV technology expands.





Summary of Vehicle Acquisitions - FY 2007-08 to FY 2021-23								
Fiscal Year	AFV					NON-AFV		Total Acquisitions
	CNG	E85	Hybrid	PHEV	BEV	Diesel	Gasoline	
2008	-	284	30	-	-	52	288	654
2009	-	303	213	-	-	44	335	895
2010	-	245	86	-	-	5	215	551
2011	-	98	4	-	-	30	109	241
2012	1	113	12	-	2	9	180	317
2013	81	220	53	-	-	21	191	566
2014	153	233	61	-	-	16	217	680
2015	35	246	69	-	-	40	331	721
2016	48	128	158	9	1	44	277	665
2017	-	221	136	6	-	46	145	554
2018	2	215	142	7	13	30	285	694
2019	0	189	161	17	8	28	250	653
2020	0	112	87	37	0	44	245	525
2021	0	74	198	44	7	37	272	632
2022	0	73	84	148	3	16	166	490
2023	0	72	65	8	42	15	199	401
Total	320	2826	1559	276	76	477	3705	9239

SUMMARY

The disruption to supply chains since 2019 has created unprecedented delays in vehicle procurement and deliveries. The State’s fleet continues to be challenged with the ability to acquire the required transportation it needs to support the reliable fulfillment of agency duties. This is demonstrated by one of the smallest procurement counts in more than a decade with only 401 vehicles received in FY2022-23. Historically, the delivery of vehicles on order was assured in the same ordering cycle. Currently, the State is required to move orders from vendor to vendor to ensure reliable, safe, and efficient transportation for State employees.





The impact of this disruption has been fewer vehicles acquired in each of the past four fiscal years. FY 2022-23 had a particularly large drop in PHEV availability from the manufacturers. However, the State's efforts to position itself in alignment as an early adopter of Zero Emission Vehicle (ZEV) regulations has permitted Colorado a greater access to BEV model sales. Automotive manufactures have prioritized these ZEV adoption states for larger allocations of the EV models they build.

The State's commitment to procuring AFV has increased the count of EVs and Hybrids in the fleet while demonstrating an overall reduction to petroleum. The vehicle transportation industry has become vastly more complex as technology advances, infrastructure develops, and organizational priorities evolve for public and private entities alike. The logistical solutions for transporting State employees to serve the public has likewise become more complex. The State's large footprint creates extreme challenges with AFV solutions, and insights into the most efficient operation of the transportation vehicle is situational.

Fleet ownership is still an absolute necessity for providing many State services. With ownership comes the responsibility to offer guidance and support to State agencies and employees with regard to the most efficient vehicle to meet their needs. To this end, DPA is committed to working with fellow agencies to provide resources and general direction for the efficient operation of AFVs. This effort resulted in AFVs accounting for approximately half of new vehicle orders in FY 2022-23, and the Department expects that agency demand for AFVs will continue to rise in the coming years.

With each decision and technology, the need for data to analyze travel patterns increases. A key tool in the collection of operational data is the use of telematics in State vehicles. With the passage of a telematics deployment plan for the State Fleet, and approximately 1,575 additional vehicles per year receiving this technology, insights to emerging alternative fuel types will become clearer.

Vehicle fueling infrastructure is a continuing challenge because of the decentralized nature and the State's historic dependence on using private industry for fueling. The State is continuing to grow its ability to operate the necessitated EV fueling chargers. Deployment of new infrastructure is extremely costly and requires robust data analysis to better understand where new investment will be most impactful as the State moves to a new, cleaner





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transportation system. Agencies' need for this information will supersede the request for funding of a State-owned electrified fueling infrastructure. Providing actionable information will help support a successful cultural evolution toward alternative fuels.

Ultimately, disruption in the vehicle market is creating the opportunity to effectively utilize these technologies. The State must be positioned to help our employees' transition into this new era of mobility.

