



COLORADO

Department of Personnel
& Administration

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, 2022
RE: State Fleet Vehicle Acquisition Report - Fiscal Year 2021-22

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 efforts of the Department of Personnel & Administration (Department) 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 within 10% of the cost of a comparable dedicated petroleum fuel vehicle. If the cost of an AFV is more than 10%, the Department will still recommend the purchase of the most applicable AFV to the assigned agency based on Executive Orders directive for the adoption of low emissions vehicle deployment.

The State Fleet Management (SFM) program collaborates with each State agency to maximize the use of AFVs 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.





COLORADO

Department of Personnel
& Administration

SUMMARY OF FISCAL YEAR 2021 VEHICLE ACQUISITIONS

During FY 2020-21, SFM worked with State agencies, local governments, and the private sector across Colorado to adopt new, innovative vehicle solutions to support AFVs. SFM experienced significant challenges due to national supply chain shortages during the fiscal year resulting in canceled orders and rollover of need into the subsequent fiscal year. These challenges are expected to continue, however SFM remains committed to exploring a variety of procurement options to continue to increase AFV adoption.

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 FY21. The studies used telematics devices pre-installed on the vehicles to collect relevant data. As a result, two key hurdles to successful EV implementation were identified: (1) the need for information on vehicle operational area and 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 units were installed on more than 2,350 state vehicles. Telematics units are slated for 1,575 additional state vehicles in FY 2022-23. SFM efforts resulted in the expansion of Plug-In Electric Hybrid Vehicle (PHEV) and Battery Electric Vehicles (BEV).

The Department purchased 147 PHEVs, representing 36.03% of FY 2021-22 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 versatile alternative to current petroleum consuming vehicles and support 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 present technological and production limitations, but with increased adoption and demand, manufacturers are providing increased quantities of capable products. Advances in technology and reductions in cost have made BEVs more attainable. Currently, the main limitation to a broader deployment is vehicle charging





COLORADO

Department of Personnel & Administration

infrastructure. Nonetheless, the state purchased 3 BEVs, 0.74% of fleet orders in FY 2021-22. An increasing percentage of BEV purchases are expected in the years to come.

Compressed Natural Gas

For many years, the Department experienced challenges with respect to CNG vehicles. Costs generally exceed the 10% threshold and fewer CNG vehicles are offered by manufacturers. In addition, the State's vehicle ordering timeline does not align with AFV grant funding opportunities.

In FY 2021-22, 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 limited 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 agencies. In FY 2021-22, SFM ordered 82 hybrid vehicles representing 20.1% 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 carbon footprint of the State fleet.

Flexible Fuel Vehicles

In FY 2021-22, the Department placed orders for 72 E85 Flexible Fuel Vehicles (FFV) representing 17.65% of all vehicle orders. The cost of fuel and equipment to outfit vehicles for E85 is less than 10% of comparable standard petroleum vehicles. Although E85 fuel has been cost effective, industry trends and announcements from vehicle manufactures have resulted in more limited availability of E-85 options. 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.





COLORADO

Department of Personnel
& Administration

Petroleum Vehicles

In FY 2021-22, the Department ordered 104 dedicated petroleum vehicles, representing 25.49% of all vehicle orders. Of these purchases, 92 were gasoline and 12 were diesel vehicles. Respectively, this represented 22.56% and 2.94% 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. Two thirds of petroleum vehicles (42) purchased in FY 2021-22 were for special purposes within 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 the 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 current Executive Orders. 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.

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 State agencies to identify the correct AFV available for their needs. SFM also produces documentation to guide departments 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 other vehicle options, and another type of alternative fueled vehicle such as CNG or E85 will be selected where possible. The last option will be to purchase a gasoline or diesel petroleum vehicle, only when no suitable alternative exists. If the available proposed AFV model will not work for an agency, a "Non-AFV Purchase Justification Form" must be completed and signed





COLORADO

Department of Personnel
& Administration

by the Executive Director of each agency. This form is reviewed by SFM for approval before an alternate purchase can be made.

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, EV charging suppliers, infrastructure manufacturers, and developers to foster best practices and strategies to develop AFV infrastructure statewide. Effective adoption and deployment of AFVs relies on adequate concentrations of AFV vehicles in place at or near compatible fueling and charging sites. Therefore, with the increase of AFVs, it is imperative that charging infrastructure be placed at facilities where these vehicles are located. In some cases, this includes placing charging infrastructure in the homes of State employees who are issued State-owned AFVs.

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 AFV operation, including access to charging at the overnight storage location and while on the road. The State of Colorado sets an example for other governments and private fleets by purchasing EVs, working closely with the CEO, and coordinating the distribution and use of AFVs across all agencies. 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 in our communities and along our major transportation corridors. Beginning in 2019 and ongoing, significant progress has been made by the State, including the establishment of specific and measurable goals and strategies. 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)





COLORADO

Department of Personnel
& Administration

emissions from transportation sources through vehicle electrification. These directives have put additional focus on Zero Emission Vehicle (ZEV) technologies to achieve these goals.

Working closely with the Colorado Energy Office (CEO) and other State agencies, SFM provides guidance on the proper placement of these vehicles and additional charging equipment to maximize successful deployment. One example would be the continued expansion of the PHEV platform. The flexibility of the PHEV's dual fuel sources is a promising bridge technology to capitalize on the expansion of the EV charging infrastructure, by supplementing a portion of petroleum fuel consumption with electrical charging. To be successful, State agencies will need to ensure regular charging of PHEVs and manage fleets in a way that maximizes the environmental and economic benefits which come from the electric drivetrain.

The CEO is the lead agency focused on charging infrastructure in the State. 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 State agencies to identify locations for new charging stations. Multiple stations have already been installed, and it is expected that more than 200 stations total will be installed as a result of this funding. CEO is also working with SFM and the State agencies to implement an EV Take Home policy which will allow employees to charge state-owned vehicles at home and be reimbursed for the electricity costs.

AVAILABILITY OF AFV INFRASTRUCTURE STATEWIDE

Infrastructure remains a critical hurdle to the effective deployment of alternative fuel vehicles and public and private entities are taking steps to address the existing 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, the CEO made an award to install 34 high-speed charging stations across Colorado's major transportation corridors. Currently 26 of those 34 stations are operational, and all but one will be installed by the end of 2022. 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,





COLORADO

Department of Personnel & Administration

which will offset some of the costs for installing charging stations at State facilities in Xcel's territory.

EXEMPTIONS

The Department's executive Director is required to adopt a policy to allow some vehicles to be exempted from the AFV purchase requirements. Current exemptions include:

- The Colorado Department of Public Safety (CDPS) law enforcement patrol, undercover, and specialized vehicles, like crime scene labs and hazardous materials vehicles are exempted from this requirement until such time AFVs are available and certified. The CDPS is required to purchase AFV vehicles wherever practicable except for the exemptions listed above.
- Non-CDPS law enforcement "certified patrol" vehicles used by State agencies are exempt from this requirement until such time AFV vehicles are available and proven reliable and certified for this function. At this time these models include: Police Dodge Chargers, Chevy Police Tahoe, Ford Police Expedition and Interceptor Utility, and Police Dodge Durango. Note: Currently there are no "Pursuit"-rated CNG or Electric models available for patrol vehicles from the manufacturer. This "Pursuit" rating is a standard of the Colorado State Patrol (CSP) to perform the required task.
- Vehicles with specialized equipment which 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: drilling units, water tanks, lab/research equipment, plumbing or telecommunications equipment, and patient or inmate 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, the Governor's office has final signature authority for Non-EV purchases.





COLORADO

Department of Personnel & Administration

The table below identifies the number of vehicle acquisitions by AFV category within each State agency for FY 2021-22.

FY2021-22 Acquisitions by Department and Fuel/Hybrid Type								
Department	AFV					NON-AFV		Total by Department
	CNG	E85	Hybrid	PHEV	BEV	Diesel	Gasoline	
CDPS	0	8	5	2	0	1	41	57
CDA	0	0	2	3	0	1	2	8
CDOC	0	2	1	87	0	0	5	95
CDE	0	0	0	0	0	0	1	1
CDPHE	0	0	1	5	0	0	0	6
CDHE	0	0	3	0	0	1	5	9
CDHS	0	4	2	10	0	0	14	30
LAW	0	0	0	5	0	0	0	5
DOLA	0	0	0	4	0	0	0	4
CDLE	0	2	0	0	2	0	0	4
DMVA	0	1	0	0	0	0	0	1
DNR	0	42	15	6	0	5	18	86
DOR	0	1	5	18	0	1	2	27
DORA	0	0	11	1	0	0	0	12
SOS	0	0	0	0	0	0	0	0
CDOT	0	11	31	6	0	0	2	50
GOV	0	0	2	0	0	3	0	5
DPA	0	1	0	0	1	0	2	4
JUD	0	0	4	0	0	0	0	4
Total Acquisitions	0	72	82	147	3	12	92	408
Percent of Total	0.00%	17.65%	20.10%	36.03%	0.74%	2.94%	22.55%	100.00%





COLORADO

Department of Personnel
& Administration

AFV VEHICLE ACQUISITIONS - FY 2007-08 to FY 2021-22

Since January 2008, Colorado has been committed to purchasing AFVs available in the marketplace. Charging infrastructure continues to be an important aspect in successful deployment as noted above. Budget constraints can adversely impact the timeline of investment. For example, the economic recession in FY 2008-09 resulted in a restriction of vehicle purchase in FY 2010-11 and FY 2011-12 limited to only those with an impact on life, health, or safety. Most of these vehicles were for the CDPS State Patrol Division with limited AFV opportunity, the majority 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.

Between FY 2007-08 to FY 2021-22 SFM purchased a total of 5,007 alternative fuel vehicles. E-85 vehicle purchases have reduced due to the corresponding reduction in fuel infrastructure as well as a reduced number of vehicle options. Increasing AFV options in the marketplace 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 1,535 hybrid vehicles between FY 2007-08 and FY 2021-22. The PHEV platform continues to grow with a total of 358 vehicles purchased between FY 2007-08 and FY 2021-22.

The 36 BEV purchases have been a concisely focused effort using lessons learned from previous AFV rollouts to identify current State owned infrastructure then review 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.





COLORADO

Department of Personnel
& Administration

Summary of Vehicle Acquisitions - FY 2007-08 to FY 2021-22								
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	67	167	57	7	36	257	591
2021	0	124	161	115	2	16	178	596
2022	0	72	82	147	3	12	92	408
Total	320	2758	1535	358	36	429	3350	8786

SUMMARY

The disruption to supply chains in FY 2021-22 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 the reduction in all vehicles received into the fleet in the same fiscal year. Historically, the delivery of vehicles on order was assured in the same ordering cycle. The overall impact has been fewer vehicles acquired in FY 2021-22.

The State’s commitment to procuring AFVs has increased the overall percentage of these vehicles within the fleet while demonstrating a reduction in petroleum use. 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 foot print creates challenges with AFV solutions and insight into the most efficient operation of the transportation vehicle is situational.





COLORADO

Department of Personnel & Administration

DPA is committed to working with State agencies and providing resources and direction for effective procurement and operation of AFVs. This effort has resulted in AFVs accounting for more than two-thirds of new vehicle orders in FY 2021-22 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 fleet vehicles. With the passage of a telematics deployment plan, and approximately 1600 vehicles per year receiving this technology, insights to emerging alternative fuel types will continue to increase.

Vehicle fueling infrastructure is a continuing challenge because of the decentralized nature and the dependence on using private industry for fueling and charging. The state is continuing to mature its ability to operate the necessitated EV fueling chargers. Deployment of new infrastructure is costly and requires robust data analysis to better understand where new investment will be most impactful as the State moves to a new, cleaner transportation system. State 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 transition to alternative fuel vehicles.

