CITY OF OAKLAND

AGENDA REPORT

TO:	Jestin D. Johnson City Administrator	**FROM:**	G. Harold Duffey Director, Oakland Public Works
SUBJECT:	City Fleet Electrification Plan and Status Update	**DATE:**	April 24, 2024

City Administrator Approval Jestin Johnson (May 10, 2024 12:48 PDT) Date: May 10, 2024

RECOMMENDATION

Staff Recommends That The City Council Receive An Informational Report On The City's Fleet Electrification Plan And Status Update.

EXECUTIVE SUMMARY

This Informational Report is to provide an update regarding the status of compliance with the following California Air Resources Control Board (CARB) regulatory mandates relative to the City of Oakland (City) vehicle fleet: 1) Advanced Clean Fleet Rule; 2) In-Use Off-Road Diesel-Fueled Fleets Regulation (Off-Road Regulation); and 3) Advanced Clean Truck Regulation. These three State mandates represent the most recent regulatory obligations under which the City procures and operates fleet vehicles and equipment. The City fleet procurement and operations are also guided by the following City Policies: 1) Zero Emission Vehicle (ZEV) Action Plan; 2) Equitable Climate Action Plan (ECAP); and 3) Environmentally Preferable Purchasing Policy.

The City fleet consists of approximately 1,570 on-road vehicles, of which approximately 1,045 are currently suitable for electrification. The rolling stock (replacement) value of these 1,570 vehicles is estimated at $220 million, which requires $22 million annually over a 10-year period to achieve a 10-year vehicle age. Historically, fleet replacement funding has been fixed much lower at $6.4 million/year, leading to the current unacceptable average vehicle age of 10.4 years. Industry standards indicate the fleet should be an average age of 6.7 years. Due to the significant underfunding of vehicle replacements, the City fleet has become more aged and unreliable. The number of vehicles at or exceeding recommended service life has dramatically increased while the unfunded costs of replacement have steadily increased. This funding liability grows exponentially with the increased expense of replacing gasoline and diesel vehicles with ZEV.

City Fleet Vehicle Composition By Replacement Grade						
Vehicle Type	Quantity	A Grade	B Grade	C Grade	D Grade	F Grade
Marked Patrol Vehicle	304	32	30	0	0	242
Sedan	555	196	44	63	40	200
Medium Duty Trucks	357	115	9	40	14	179
Heavy Duty Trucks	177	81	14	6	11	65
Fire Engine	33	11	0	0	0	22
Fire Ladder Truck	11	5	0	0	0	6

(Replacement Letter Grade A = Excellent, B= Good, C = Fair, D = Poor, F = Unacceptable)

The fleet is divided into four categories, representing the four phases of implementation: 1) Medium/Heavy Duty; 2) Light Duty; 3) Police Patrol; and 4) Fire Response. The CARB regulations that went into effect January 1, 2024, require the acquisition of more costly ZEV replacements and the associated fueling/charging infrastructure for the Medium/Heavy-Duty fleet segment. These regulations apply to 275 vehicles (156 Medium Duty and 119 Heavy Duty vehicles) and are estimated to cost $92.7-$102.7 million. Electrifying the remaining Light Duty and Police Patrol vehicle segments of the fleet will cost $34.1-$52.4 million and $65-$75 million, respectively. This brings the total cost for electrifying 1,045 of the 1,570 vehicles in the City fleet to $191.8- $230.1 million. No practical zero emission solutions exist for the OFD Fire Response fleet, so costs for electrifying this potential fourth fleet category are not included. No funding has been identified or provided to enable compliance or execute any of the activities noted within this report.

BACKGROUND / LEGISLATIVE HISTORY

The City fleet consists of approximately 1,570 on-road vehicles and pieces of equipment with a rolling stock value (replacement cost) of $220 million. The fleet has been transitioning to alternative low-carbon and renewable fuels for over two decades, and includes the following alternative fuel and advanced technology vehicles:

COUNT	ALTERNATIVE FUEL TYPE
532	Renewable Diesel (RD) vehicles
150	Hybrid Electric Vehicles (HEV)
113	Renewable Natural Gas (RNG) Vehicles
117	Battery Electric Vehicles (BEV) and Plug-in Hybrid Vehicles (PHEV)
12	Liquefied Propane Cas (LPG/Autogas)
4	Hydrogen Fuel Cell Vehicles (HFCV)
928	**Total alternative fuel and advanced technology vehicles**

While all alternative fuels offer significant emission reduction benefits compared to petroleum fuels, only Battery Electric Vehicle (BEV) and Hydrogen Fuel Cell Vehicle (FCV) technologies meet the State's zero emissions standards. The City currently has

117 BEV and 4 FCV units. These 121 vehicles comprise 7.5% of the overall fleet and are all in the Light Duty fleet segment. To support the 117 plug-in vehicles, Equipment Services has deployed one Direct Current Fast Charger (DCFC) and 29 Level II (58 charging ports) Electric Vehicle Supply Equipment (EVSE), otherwise known as EV Chargers. This significant alternative fuel vehicle and infrastructure deployment averaged $6.4 million annually from 2014 to 2023 .

The City became a leader in reducing transportation related emissions and enabled these clean air vehicle deployments over the past two decades by taking the following legislative and policy actions. Many of these actions preceded and surpassed California's nationally known and very aggressive statewide climate protection and emission reduction goals.

2003- Resolution No. 77842 C.M.S. "Green Fleet Resolution" directed staff to purchase vehicles powered by alternative fuels, improve the energy efficiency of the fleet, and reduce emissions by selecting "lowest emission vehicles that are available".

2007- Environmentally Preferable Purchasing Policy directed staff to minimize environmental impacts, reduce greenhouse gas emissions, and purchase sustainable commodities such as re-refined lubricants. This policy specifically directed staff to consider Alternative Fuel Vehicles (AFV) powered by zero emission technologies such as BEV and HFCV.

2009- Resolution No. 82129 C.M.S. directed staff to develop the City's first climate strategy with a Greenhouse gas (GHG) emission reduction target of 36 percent below 2005 levels; it also established a long-term GHG reduction target of 83 percent by 2050.

2012- The City Council adopted the Energy and Climate Action Plan per Resolution No. 84126 C.M.S.. This Plan identified and prioritized actions the City could take to reduce energy consumption and GHG emissions associated with Oakland. This plan established GHG reduction actions such as regional BEV planning, low carbon fuel use, accelerated replacement of the City fleet, and reduction of transportation impacts of City operations by deployment of zero and low technologies such as BEV and Plug-in Hybrid Electric vehicles (PHEV).

2018- The City Council adopted Resolution No. 87183 C.M.S., which established a GHG emissions reduction target of 56 percent below 2005 levels by 2030. The same year, the City Council adopted Resolution No. 87397 C.M.S., declaring a climate emergency and calling for regional collaboration and a "citywide just transition and urgent climate mobilization effort to reverse global warming as quickly as possible towards zero net emissions."

2020- The City Council adopted Resolution No. 88267 C.M.S., approving the 2030 ECAP, a comprehensive plan responsive to the abovementioned Resolutions. The

ECAP addressed both GHG mitigation and climate resilience through an equity lens, leveraging the tools and policy levers available through the City's regulatory and legal spheres of control to reduce local GHG emissions on a path projected to exceed the Council's adopted 2030 and 2050 reduction targets.

2020- The City Council adopted Resolution No. 88268 C.M.S., approving a Carbon Neutrality Target of 2045. Achieving carbon neutrality will require complete decarbonization (ensuring that all mechanical systems run on clean electricity) of Oakland's transportation sector.

2022- The City Council adopted Resolution No. 89448 C.M.S. approving the ZEV Action Plan- January 2023, which focused on increasing the access to and deployment of City and privately owned ZEV and charging infrastructure.

In concert with the City's legislative and policy actions regarding clean air vehicles, the State of California implemented the following actions.

2006- California enacted Assembly Bill (AB) 32, the Global Warming Solutions Act, which required California to reduce its GHG emissions to 1990 levels by 2020 — a reduction of approximately 15 percent below emissions expected under a "business as usual" scenario.

2016- California enacted Senate Bill (SB) 32, the Global Warming Solutions Act of 2016, which expanded on AB 32's emission reduction goals by requiring Statewide GHG emissions to be reduced to 40 percent below 1990 levels by 2030.

2018- California enacted the Electric Vehicle Charging Infrastructure Act (Assembly Bill 2127), which directed the California Energy Commission (CEC) to assess the changing needs of an increasingly electric statewide truck fleet along with implications for the state's electricity grid through 2030.

2018- CARB adopted the Innovative Clean Transit Rule, which requires increasing percentages of the state's bus fleets to be zero emission over time. These zero-emission bus purchase requirements begin in 2023 and gradually increase to 100% zero-emission bus (ZEB) acquisitions in 2029.

2021- CARB adopted the Advanced Clean Truck regulation, which mandates fleet reporting and requires manufacturers to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. The Large Entity Reporting (LER) component of the Advanced Clean Truck regulation required one-time reporting for large entities that operated or dispatched vehicles with a manufacturer's gross vehicle weight rating greater than 8,500 lbs. in California. It included medium duty vehicles like vans and ¾-ton pickups such as the F250 or Ram 2500 and heavier vehicles of all configurations and fuel types.

2023- CARB approved amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulation (Off-Road Regulation), which was implemented on January 1, 2024. The regulations required fleet reporting, retirement of older diesel-powered vehicles, and the use of Renewable Diesel. The regulations also apply to rented vehicles and vehicles used by contracted vendors.

2024- CARB adopted the Advanced Clean Fleet Rule, which requires fleets (outside designated low-population counties) to meet the following truck acquisition standards: 50% of the total number of vehicle additions over 8500 gross vehicle weight rating must be ZEV beginning January 1, 2024, increasing to 100% on January 1, 2027. Notably, most law enforcement and emergency response vehicles are exempted.

ANALYSIS AND POLICY ALTERNATIVES

The City Fleet Electrification plan began in 2014 when the City joined eight other local Bay Area fleets as part of the Metropolitan Transportation Commission's (MTC) EV Fleet Grant. The MTC grant funding enabled acquisition of three Nissan Leaf EV's and three Level II EV chargers. The City subsequently grew the plug-in vehicle fleet from the initial 3 vehicles to 117 vehicles, and installed a DCFC and 29 Level II EV charging stations (58 charging ports). This was accomplished gradually with no specific funding designated for these activities. Due to the recently implemented direct funding model for fleet vehicles, and newly enacted CARB regulations, the previous incremental funding strategy is no longer viable. OPW Equipment Services is no longer funded with what was traditionally $6.4 million annually to perform vehicle replacement activities and has no alternate funding source to acquire ZEV and required EV charging infrastructure. Departments now decide which vehicles to replace and internally fund all vehicle and EV charging infrastructure acquisitions. There is no longer a mechanism or funding in place to ensure a percentage of the fleet is replaced each year.

The following Citywide priorities are advanced by this recommended policy action; **1) holistic community safety** will be enhanced to the extent that the Fleet Electrification Plan involves a significant deployment of new zero emission vehicles that will be used to respond to law enforcement and public health safety concerns; **2) vibrant, sustainable infrastructure** will be directly supported by an infusion of new zero emission vehicles and equipment, and a state of the art EV charging network that will include workplace charging and likely publicly accessible locations; and 4) **responsive, trustworthy government** in that the significant deployment of zero emission vehicles will result in drastically reduced tailpipe emissions which are harmful to the health and well-being of Oakland residents, and the shift to battery electric technology is expected to reduce fleet operational costs as well fuel expenses.

Strategy

Of 1,570 vehicles in the City fleet, 121 are already ZEV, and another 404 do not have ZEV versions or are unsuitable for ZEV technology due to application/use. The City's fleet electrification strategy includes those 1,045 vehicles suitable for electrification and has been separated in four components (Phases) shown below in priority sequence: 1) Medium/Heavy-Duty fleet vehicles and chargers; 2) Light Duty fleet vehicles and chargers; and 3) Oakland Police Department (OPD) Police Pursuit vehicles and chargers; and 4) Fire Response. . Of the four Phases, only Phase 1 (Medium/Heavy Duty) is mandated at this time. While the Oakland Fire Department (OFD) has expressed interest in demonstrating electric equipment when it becomes available, battery electric fire response vehicles are not widely available. Accordingly, Phase 4 (OFD) is not addressed in this report. To assist with planning the City's Fleet Electrification effort, the City commissioned Ava Community Energy (formerly East Bay Clean Energy) through a no-cost grant to develop fleet transition assessments for the Light and Medium/Heavy Duty Phases. The OPD law enforcement fleet assessment could not be funded through the Ava no-cost assistance program.

FLEET COMPONENT/PHASE	**COUNT**	**10-YEAR TOTAL COST**	**ANNUAL FUNDING**
1). Medium/Heavy-Duty Fleet	275	$85M - $95M	$8.5M - $9.5M
2). Light Duty Fleet	420	$34M - $52M	$3.4M - $5.2M
3). Police Patrol Fleet	350	$65M - $75M	$6.5M - $7.5M
4). Fire Emergency Response	TBD	TBD	TBD
TOTAL	**1045**	**$184M - $222M**	**$18.4M - $22.2M**

Phase 1- Replace Medium/Heavy-Duty Fleet with BEV- $92.7-$102.7 million
The strategy of focusing on Light Duty BEV deployment shifted in 2023 when it became clear that the Advanced Clean Fleet Rule mandating the acquisition of zero emission Medium/Heavy Duty vehicles would soon be implemented. To date, the City has only a single Medium Duty BEV and no Heavy-Duty BEVs. There are 156 Medium Duty and 119 Heavy Duty vehicles that may be replaced with zero emission versions. The relatively new market for BEV Medium and Heavy-Duty trucks is still evolving, and few vehicle types are available as BEV at the time of this report. However, based on the cost of available vehicle types the cost of electrifying the medium and Heavy-Duty fleet is estimated at $85-$95 million. Adding the additional DCFC, DC (slow), and Level II EVSE to support the 274 Medium and Heavy-Duty BEVs is estimated to cost $7.7

million. Some sample vehicles comparing costs of Medium and Heavy-Duty petroleum fuel to costs of BEV versions are below:

Vehicle Type	Diesel	Battery Electric	INCREMENTAL COST
Sewer Flusher	$560,000	$860,000	$310,000
Sweeper	$450,000	$850,000	$400,000
Refuse Packer	$475,000	$800,000	$325,000
Dump Truck	$280,000	$575,000	$295,000
Service Truck	$90,000	$130,000	$40,000

Phase 2- Replace Light Duty Fleet with BEV- $34.1-$52.4 million

The City initially focused on deploying light duty BEVs since these were the first vehicle category to hit the market and were broadly available. To date, the City has deployed 117 plug-in vehicles and 30 EV chargers. There are 437 vehicles in the Light Duty fleet that have not yet been replaced with zero emission versions. Replacing these 437 petroleum fueled vehicles with battery electric versions is estimated to cost a minimum of $28 million. The Ava Community Energy assessment identifies the cost to install the 13 DCFC and 385 Level II EVSE required to support these 437 BEV as $6.1 million. Including best practice solar Distributed Energy Resources (DER) at 9 City facilities is estimated to cost an additional $24.4 million, raising the total estimated cost of electrifying the Light Duty Fleet to $34.1-$52.4 million. While not mandated for Fleet Electrification, Battery Energy Storage Systems (BESS) are a component of Facility Electrification that increase facility resiliency and can lower energy costs. Bi-directional EV charging integrates the Fleet Electrification BEVs and Facility Electrification DER and BESS components into a single, holistic energy system with enhanced resiliency in the face of power outages, potential to realize lower energy costs, and best chance of a future proofed installation. However, deploying such a best practice integrated energy management system can be expected to dramatically increase the estimated cost.

Phase 3- Replace Police Patrol Fleet with BEV- $65-$75 million

While the Police Patrol fleet electrification study has yet to be commissioned, costs are estimated here based upon known BEV patrol vehicle (Mach-E) costs and extrapolated EVSE installation data. Replacing 350 marked police patrol vehicles with battery electric versions is estimated to cost $45 million. Adding EVSE charging support at PAB and Eastmont (primarily DCFC), is estimated to cost $20-$30 million due to the large increase in power needed to support EV charging for OPD continuous shift operations.

Phase 4- Replace Fire Emergency Response Fleet with BEV (unable to assess)

Vehicle Funding

From 2014 to 2022, the Oakland Public Works Department (OPW) Equipment Services Division was historically funded $6.4 million annually for centralized fleet vehicle replacement, when the minimum need was at least $22 million annually for petroleum fueled vehicles. Consequently, there is a significant accumulated expense to bring the fleet up to industry recommended standards. The expense dramatically increases when acquiring ZEV versions of existing vehicles/infrastructure, but there is no current funding plan or strategy to enable these more expensive ZEV and infrastructure acquisitions. For Fiscal Year 2023/24, department-specific allocations were provided as follows: $9 million to OPD/OFD; $350,000 to the Oakland Department of Transportation (OakDOT); and $500,000 to OPW to address the remaining departments. Under the decentralized fleet replacement funding model, departments are required to identify funding for vehicle acquisitions from within their internal budgets and/or submit requests for additional funding to the Budget Office. This approach is expected to complicate and delay the process of replacing petroleum vehicles with zero emission vehicles due to limited funding and multiple competing mission-essential priorities within each department.

OPW staff are aggressively seeking grant funding, with over 20 grant programs reviewed and more than 10 grant applications submitted since October 2023. While these grants can potentially be a resource to help address City funding shortfalls, grants typically cover only a portion of the total project cost and thus require “match” funding. The table below illustrates OPW grant funding efforts since 2014, and also highlights the critical need for match funding to be available to utilize vehicle and EV charger grant funding.

GRANTS AWARDED	TYPE	AMOUNT	DATE
1	3 Nissan Leaf EV's and 3 Level II chargers	$87,000	2014
47	Rebates for 27 EV and Fuel Cell Vehicles	$147,500	2015-16
2	7 Level II and 1 DCFC EV Chargers	$65,000	2016
1	First Responder Alt. Fuel Vehicle Safety Training	$15,000	2016
1	13 battery powered grounds equipment	$107,000	2017
1	MSC spec. electrical and upgrade	$250,000*	2023
1	Solar powered EV Arc EV charger (PSPS)	$65,000	2020
1	EV Charging study + 3 or more EV chargers	$180,000	2024
1	CEC CFI Grant application assistance	$50,000*	2024
3	Technician Training	$24,000	2024
1	EV education and outreach for City staff	$15,000	2024
GRANTS APPLIED	**TYPE**	**AMOUNT**	**DATE**
1	EV Forklift and charger	$85,000*	2023
3	Electrification Plan Development	$550,000*	2024
IN-PROGRESS	**TYPE**	**AMOUNT**	**DATE**
1	100 EV charging ports	TBD	2024

2	Ongoing Vehicle Voucher/Rebate Programs	% of spend	2024

*estimated

EV Charger Funding

Funding for municipal EV charging has been project-based to date, with only OakDOT receiving $200,000 for installation of EV chargers at public parking structures in the last budget cycle. There has been no ongoing funding provided for EV charger deployment. The majority of existing fleet EV charging infrastructure was funded by staff seeking grant funding and creatively identifying incremental funding to enable the installation of small projects (one or two charging stations) at various sites. As with electric vehicle acquisition, available grants typically cover only a portion of the project's total cost and require “match” funding. Without a consistent funding source for EV charger acquisition, installation, and operations, the City is likely unable to provide the necessary charging for electric vehicles as the fleet electrifies over time. This table identifies the locations and quantities of EV chargers required to implement only Phase 1 and Phase 2 (Medium/Heavy-Duty and Light Duty) of the four phase Fleet Electrification Plan:

Facility	EVs	Existing L2 Ports	L2s	Slow DC	Medium DC	DCFCs
Vireya Tropical Rhododendron Garden	2		1			
Shepard Canynon - Drainage Div	22		3	6		1
Oakland Police Department	70	8	18			2
Municipal Service Center	464	18	88	45	11	4
Library/Custodial	16		4			
KOCB/Truck Shop	150	2	22	20	12	2
Fire Station 3	14		5			
Fire Station 27	2		2			
Fire Station 26	2		2			
Fire Station 25	4		2			
Fire Station 19	2		2			
Eastmont Substation	152	6	38			2
Dalziel Garage	76	6	19			
City Center West Garage	260	8	65			2
Animal Control	10		3			
Total	**1,246**	**48**	**274**	**71**	**23**	**13**

Summary

The cost to meet compliance mandates for the Advanced Clean Fleet Rule by deploying zero emission BEV Medium and Heavy-Duty vehicles is estimated at $92.7-$102.7 million over 10 years. This is the minimum investment required to meet the state’s aggressive ZEV mandates. Electrifying the City’s Light Duty and police patrol fleets to meet the City’s policy objectives of electrifying the entire City fleet will bring the total cost of electrifying the City fleet to $191.8- $230.1 million. These costs do not include the OFD fleet, and costs can escalate dramatically with the incorporation of enhanced resiliency and power-outage proof onsite battery storage systems and bi-directional

charging. The cost of modifying City repair facilities to accommodate BEV and HFCV service and repair operations has not yet been identified.

FISCAL IMPACT

This report is for informational purposes and has no direct costs or fiscal impacts. However, failure to comply with the state regulations governing the replacement of fleet vehicles and equipment could potentially result in fines and penalties of unknown cost.

PUBLIC OUTREACH/INTEREST

This item is informational and did not require any additional public outreach.

COORDINATION

The Budget Bureau and Sustainability and Resiliency Office were consulted in the preparation of this report.

SUSTAINABLE OPPORTUNITIES

Economic: Oakland based businesses and residents may economically benefit by participating in the assessment, design, installation, and service/maintenance of BEV, EVSE, solar, and other support systems.

Environmental: Continued compliance with the state regulations and City policies governing the replacement of fleet vehicles and equipment will result in lowered vehicle emissions, corresponding improved health conditions to Oakland residents, and reduced climate change impacts.

Race and Equity: Continued compliance with the state regulations and City policies governing replacement of fleet vehicles and equipment will ensure impacts from City fleet tailpipe emissions will not disproportionately harm or overburden disadvantaged communities and communities of color in which the City fleet operates.

ACTION REQUESTED OF CITY COUNCIL

Staff Recommends That The City Council Receive An Informational Report On The City's Fleet Electrification Plan and Status Update.

For questions regarding this report, please contact Richard Battersby, Assistant Director, at (510) 915-5722.

Respectfully submitted,

Harold (Glenn) Duffey (May 9, 2024 17:27 PDT)

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