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Memo

January 28, 2019

TO: Ad Hoc Committee on Sustainability
Supervisor John Gioia, District I
Supervisor Federal Glover, District V

FROM: Brian M. Balbas, Public Works Director

SUBJECT: Electrifying Contra Costa County Fleet

This report has been prepared by the Contra Costa County (County) Departments of Public Works and Conservation and Development, at the request of the Sustainability Committee (Committee) of the Board of Supervisors. The Committee has requested information on options for increasing the number of electric vehicles (EVs) and equipment in the County fleet. This report provides context for the County's interest in EVs, reports on the current composition of the County's fleet, looks at costs and benefits of EVs, and identifies areas for policy guidance. Staff requests Board direction on how to amend the current fleet policy, with particular attention to how to fund County investments in infrastructure and vehicles, guidance on whether certain types of vehicles must be procured all-electric, and use policies for EV chargers.

1. Context

The County's Climate Action Plan (2015) found that the transportation sector is the largest source of greenhouse gas emissions – 47 percent – in the County.[1] A 2007 municipal Climate Action Plan, which focused solely on County operations, found that 42 percent of greenhouse gas emissions from County operations come from vehicles, both those used for County business and operations and those used by employees to commute to work. The Climate Action Plan includes goals for green fleet and equipment used by County employees for County business and operations, specifically:

- Create purchase orders for replacing less efficient vehicles with fuel-efficient vehicles (e.g., hybrids, electric vehicle, and biofuel vehicles) and old office machines with energy efficient machines;

[1] The emissions inventory does not include large stationary sources, which are regulated by the Bay Area Air Quality Management District and California Air Resources Board.

- Reduce County fleet use of traditional fuels 25% by 2020 compared with the baseline year of 2005.

The State of California is a leader in the deployment of alternative fuel vehicles and continues to set ambitious goals for their deployment. In January 2018, former Governor Brown set a goal of 5 million zero emission vehicles on the road in California by 2030, and a plan to spend $2.5 billion on charging infrastructure and rebates. Funds are expected to come from the State's cap and trade auctions and an existing vehicle license fee.

Vehicle exhaust creates pollution such as ozone and particulate matter, which can lead to increased levels of cardiovascular and respiratory illness, damage to respiratory systems, and even shortened life spans. The American Lung Association, in its national State of the Air report, gives Contra Costa County a grade of F for ozone and a grade of B for 24-hour particle pollution. Electric vehicles benefit public health by reducing exhaust emissions. When EVs charge using renewable forms of energy such as solar or wind, the health benefits are even greater. EVs also are quieter than gasoline vehicles, which reduces noise pollution.

Ensuring that more electric vehicles are used in Contra Costa County, and that the County has a network of charging facilities to support all types of electric transportation, is a shared responsibility. The Contra Costa Transportation Authority, working in partnership with the County, is developing an Electric Vehicle Readiness Blueprint (Blueprint) that will identify potential locations for shared mobility hubs, examine how to ensure there is sufficient electricity and capacity on the grid to support more EV charging, develop a toolkit of best practices and policies that jurisdictions can adopt, and develop a plan for training the mechanics and electricians who will build and maintain EVs and EV infrastructure. The Blueprint is being developed through a grant from the California Energy Commission and will be completed by July 2019, which will allow Contra Costa County to compete for implementation funds.

2. **Current County Fleet**

The County currently has 1,541 units in its fleet. The County's fleet is comprised of sedans; sport utility vehicles; (SUVs); vans; pick-up trucks; light-, medium-, and heavy-duty trucks, and off-road equipment. The majority of these vehicles are sedans.

Per Administrative Bulletin 508.5 the criteria for replacement inspection is 90,000 and 100,000 miles for light sedans, SUVs, pickups, and vans. The purchase cost for an average sedan is $25,000 - $35,000. The County typically replaces 60-80 vehicles per year at a cost of $2-3 million. The County is able to reduce vehicle purchase costs by participating in government purchasing pools.

County departments have slowly been adding EV sedans to their fleets; currently there are 16 EVs, with one more on order. The majority of the EVs were added in 2015 and 2016, with two more added in 2018. The Fleet Services Division is planning to purchase more Chevy Bolts in the future.

Annual maintenance costs for gasoline sedans are under $1,000; for electric sedans, annual maintenance costs are under $400. Average fuel costs for diesel are $2.80/gallon, for unleaded $2.30/gallon. The typical cost to charge an electric vehicle to travel 300 miles, for example, ranges from $11 to $20. For comparison it would cost $27.60 to drive a 25 miles per gallon internal combustion engine vehicle running on unleaded gasoline at $2.30/gallon for the same 300 miles, based on electricity cost ranging from $0.15/kWh to $0.25/kWh. The City of Sacramento in 2017 reported that its average annual costs to operate and maintain gasoline sedans in its fleet were $0.062 per mile per vehicle, $17,770 per vehicle; average annual costs for EV sedans were $0.030 per mile per vehicle (51% less than gasoline sedans), $6,550 per vehicle (66% less than gasoline sedans).[2]

Below is a snapshot of the current County fleet of all vehicles, including electric vehicles.

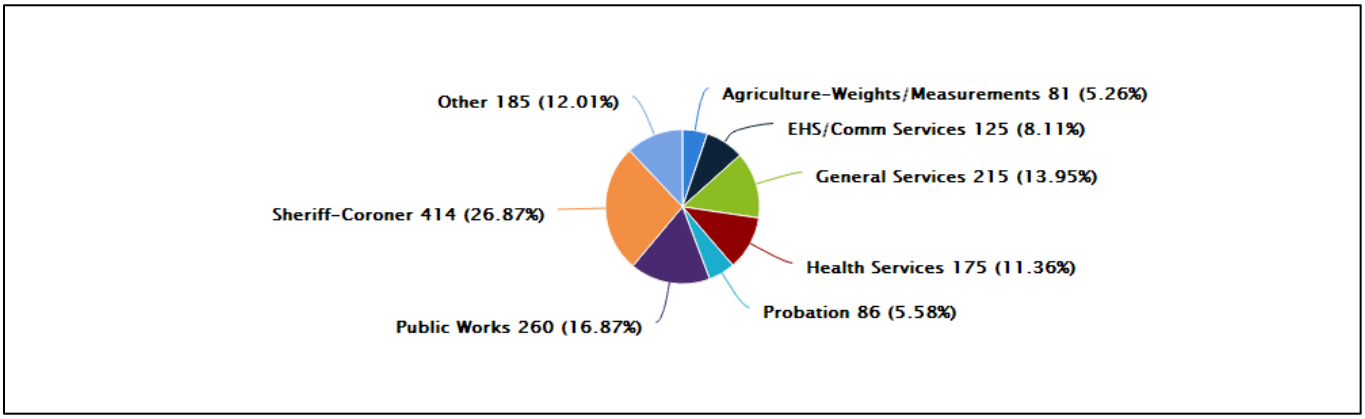
Table 1. Current County Fleet - All Vehicles

Department	Number of Vehicles (including EVs)	Number Electric Vehicles
General County Services	2	
County Administrator	20	1
Treasurer-Tax Collector	1	
Assessor	3	
Health Services	175	
EHS/Comm Services	125	
Clerk-Recorder	3	
Sheriff-Coroner	414	
Probation	86	
Agriculture-Weights/Measurements	81	
Veterans Affairs	1	1

[2] City of Sacramento, *Electric Vehicle Strategy*, December 12, 2017, p. 7.

Department	Number of Vehicles (including EVs)	Number Electric Vehicles
Community Development	1	
Animal Services	34	
Conservation & Development	38	1
CCC Dept Child Support Svcs	3	
District Attorney	33	
Public Defender	16	
Public Works	260	14
General Services	215	
Library	4	
Risk Management	1	
County Administrator - DOIT Admin	2	
Facilities Management	1	
Sheriff - Patrol	8	
Courts - Gen Prop Non-HS Clearing	12	
Health Services - Haz Mat – Special Programs	3	
TOTAL	**1541**	**16**

Figure 1. Total unit/equipment by owning department



The County has installed EV chargers for County vehicles at several locations:

Table 2. EV Chargers at Contra Costa County Facilities

Location	# of ports	Status
651 Pine Street, Martinez	14 (parking lot)	Pending
New Office of Emergency Services	13	Pending
West County Health Center	2	Pending
Old Jail, Martinez	1	Active
Bisso Lane, Concord	2	Active
Stanwell Circle	2	Active
2467 Waterbird Way, Martinez	4	Active
255 Glacier Drive, Martinez	6	Active
30 Muir Road, Martinez	2	Pending
Total	46	

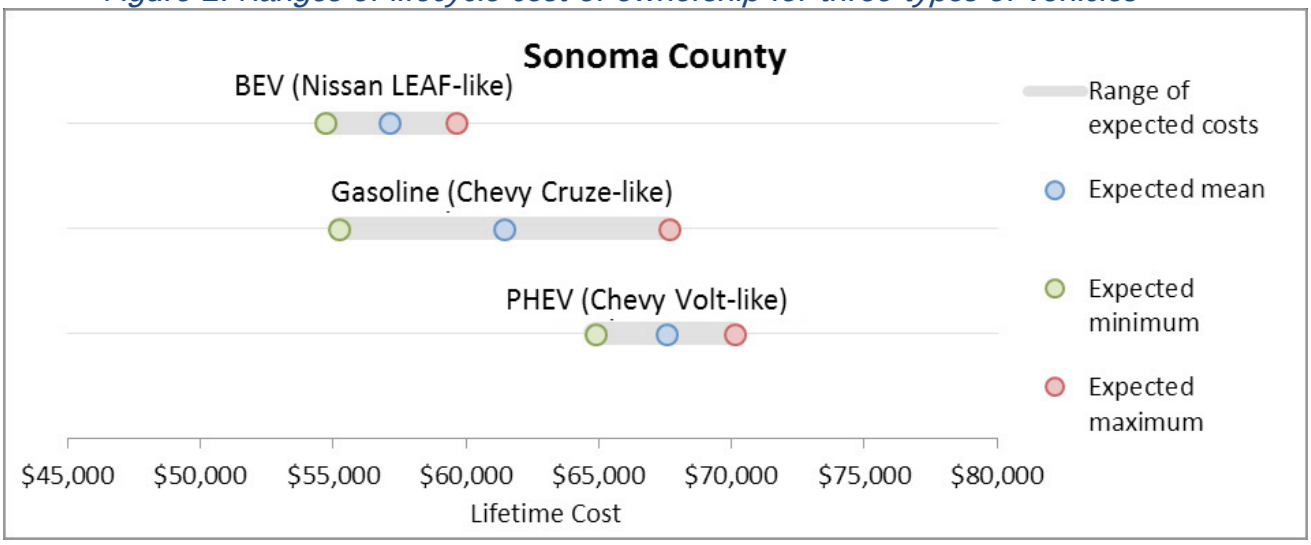
In 2015, the County adopted a policy that exceeds State requirements for installing EV chargers in non-residential projects that are approved by the County. In accordance with this policy, the new County Administration building has 14 EV charging stations that are available to employees who have access to the parking lot; the new Emergency Operations Center will have 10 EV charging stations in the secure parking lot and 3 that are public facing.

3. Benefits of Electric Fleet

An electric fleet provides health, air quality, and economic benefits. As discussed above, electric vehicles have lower fuel costs than gasoline vehicles. When paired with charging from renewable energy sources, most often solar, their operating emissions profile is very low. EVs also have lower maintenance costs than gasoline vehicles. Because the County owns a number of EVs, County fleet maintenance staff is trained already to service these vehicles and County electricians are familiar with installing charging infrastructure.

Public agencies in Sonoma County have been integrating electric vehicles into their fleets for over 10 years. The Sonoma County Transportation Authority and Regional Climate Protection Authority recently published a guide on how to accelerate the transition to electric vehicles. The guide includes life-cycle cost estimates for gasoline, plug-in electric, and plug-in hybrid vehicles.

Figure 2. Ranges of lifecycle cost of ownership for three types of vehicles[3]



4. Rebates and Incentives

There are a number of rebate and incentive programs in California and the Bay Area to facilitate the deployment of electric vehicles and charging infrastructure. Below is a summary of those programs and how they might apply to the County.

PG&E Electric Vehicle Charge Network Program (EVCN) - Under the EVCN, PG&E pays for, maintains, and coordinates all "make ready" EV charging system infrastructure from PG&E's on-site transformer to 10 parking spaces at a County facility. The County pays for the cost of the chargers and their installation. PG&E provides a rebate to offset approximately 25% of the cost of the charger and associated mounting hardware for each charge port installed.[4]

Electrify America Program - Electrify America is a subsidiary of VW established in 2018 to promote electric vehicles and build a nationwide charging network with $2 billion. $800 million is directed to California. The program is overseen by the U.S. Department of Justice. Electrify America LLC has engaged Greenlots to procure, install, and manage EV charge stations at workplace sites. The program has greater flexibility than the PG&E EV Charge Network program, allowing for the installation of two to ten chargers at a facility as opposed to a minimum of ten. In addition, the Electrify America program is turn-key whereas the PG&E program only covers make-ready infrastructure. The County's participation in Electrify America does not preclude participation in the

[3] Sonoma County Transportation Authority and Regional Climate Protection Authority, *Shift Sonoma County: Plug-in Electric Vehicle Fleet Recommendations*, Updated January 2018, p. 21.
[4] The California Public Utilities Commission (CPUC) has approved close to $400 million for PG&E to facilitate the installation of light-, medium-, and heavy-duty EV infrastructure. It is not clear what impact, if any, PG&E's potential bankruptcy will have on its EV program.

PG&E EVCN program, which the County is continuing to pursue. The Electrify America "Cycle 1" program was only opened up to Contra Costa County recently; it is not possible for the County to meet the contractual installation date requirements for this round. The County will explore how it can participate in future cycles.

BAAQMD Charge! - The Charge! Program provides a grant of up to $4,000 per dual-head, Level 2 charger. The program can be combined with the PG&E EVCN program with restrictions. The project sponsor is required to cover 75% of eligible project costs.

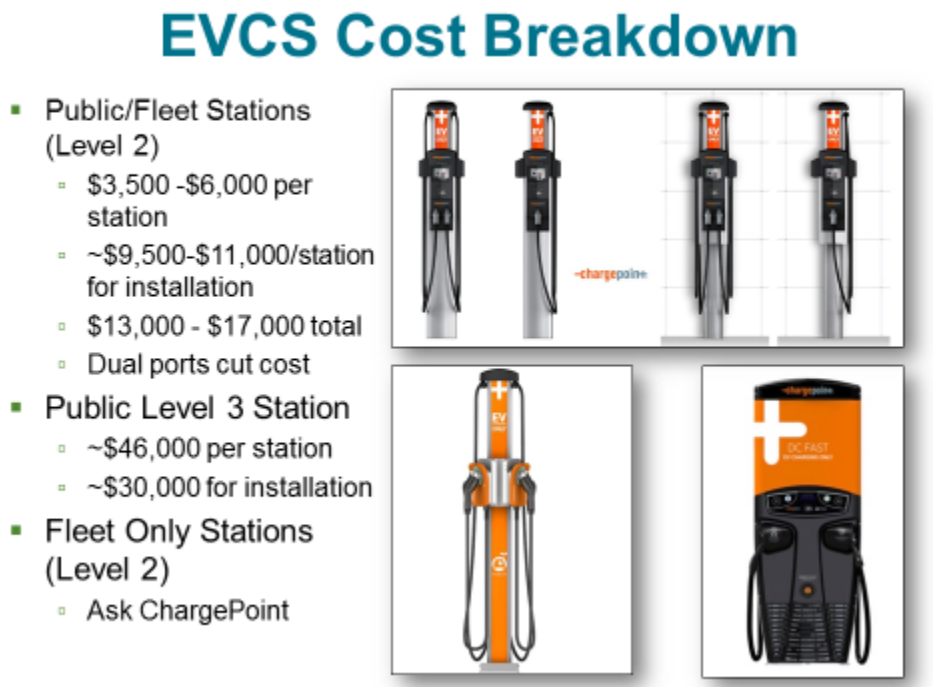
MCE EV Charger Rebates - MCE has two EV charger rebate programs, one specifically to accompany PG&E's EVCN which provides $1,134 per charge head, and one for EV chargers installed without other incentives which pays a cash rebate of up to $2,500 per head.

CARB Low Carbon Fuel Standard (LCFS) Program **-** The California Air Resources Board (CARB) developed the LCFS program to reduce the Carbon Intensity of the California fuel pool by at least 10% by 2020. Similar to the Cap-and-Trade program for stationary pollution sources, the LCFS creates a means for entities that produce fuels with a carbon intensity higher than standard levels (deficits) to provide funding to entities that produce fuels with a lower than standard carbon level (credits). An example of a "deficit" generator is an oil refinery; a "credit" generator is an entity such as Contra Costa County that provides clean electricity to electric vehicle charging stations. By participating in the program, the County will receive program credits for each kWh delivered to electric vehicle chargers owned and operated by the County. These credits can be monetized through the CARB LCFS program and the proceeds used to offset the cost of owning and operating the electric vehicle chargers and/or to reduce the cost of charging for employees and the public. County facilities powered by solar generate more credits because their carbon intensity is lower.

5. **Costs of Electric Fleet**

Costs associated with building out an EV fleet include costs associated with purchasing, installing, and maintaining the chargers; installing the wiring and trenching to bring electricity to the chargers; and purchasing vehicles. The charging infrastructure is the larger cost to consider, because the County will be replacing vehicles anyhow, it is just a matter of whether vehicles are replaced with gasoline or electric motors.

Alameda County shared with County staff the estimates below on purchasing and installing different types of charging facilities.



Sonoma County published installation guidelines for EV Charging Infrastructure in November 2018, which include these cost estimates:[5]

Table 3. Estimated costs for Multiple Dwelling Units and Workplace EVSE Installations [6]

Cost Element	Level 1		Level 2		DC fast charge	
	Low	High	Low	High	Low	High
Hardware	$200	$500	$500	$2,000	$10,000	$30,000
Permitting	$100	$500	$100	$1,000	$500	$1,000
Installation	$500	$5,000	$2,000	$6,000	$60,000	$100,000
Trenching/Concrete [a]	$3,000	$25,000	$3,000	$25,000	$3,000	$25,000
Total, installed [b]	**$3,800**	**$11,000**	**$5,600**	**$14,000**	**$73,500**	**$150,000**
Networking (annual)	$120	$300	$120	$300	$120	$300
Maintenance	$100		$100		$100	

[a] The high cost scenario does not assume a $25,000 cost associated with trenching and concrete because this inflates the costs significantly and is considered more of an outlier than a true indication of the high cost that might be expected. Rather, the project team used a trenching cost of $5,000.

[5] Sonoma County, *Electric Vehicle Charging Infrastructure in Sonoma County: Installation Guidelines*, November 2018, p. 16.
[6] Electric Transportation Engineering Corporation, "Electric Vehicle Charging Infrastructure Deployment Guidelines for Greater San Diego," pgs. 55-58, May 2010.

[b] The total cost does not include the annual costs associated with networking. These are shown for illustrative purposes only.

6. Policy Issues

There are several policy issues on which Board guidance would be useful as the County works to increase the number of electric vehicles its employees drive for County business.

a. **Who pays for charging infrastructure and chargers at County facilities?** Current County budget policy calls for each department to make infrastructure investments, including vehicle purchase, out of its budget. This means that departments must decide whether to invest in the infrastructure costs of trenching and wiring and purchasing and installing chargers, as well as vehicle purchase costs. As illustrated above, these first costs can be higher than costs to purchase traditional vehicles. If the Board wants to increase the number of EVs in the County fleet, it might consider setting aside funds in the County budget for the EV fleet buildout. This might include only the costs associated with wiring, trenching, and charger purchase and installation, or it might include vehicle purchase cost as well.

b. **What types of vehicles and uses are best suited for electric?** The Board could establish guidelines for when a vehicle type should be purchased as electric. These might include sedans, SUVs (as more are manufactured all-electric), and other types vehicles as they become available with sufficient range for their primary use.

c. **Use policies for chargers.** The Board will want to provide direction on use policies for charging both County vehicles and personal vehicles driven by County employees.
    i. *County vehicles*. EV range is increasing and today is over 200 miles/charge. This longer range should remove range anxiety (fear of running out of charge) on the part of County staff and facilitate EV acceptance. Because County vehicles are being used for County business, the goal should be to ensure that vehicles are charged in the most cost-effective manner. Currently that may mean charging during off-peak hours, particularly overnight. As more options become available to install solar or other renewable energy sources or stored energy in conjunction with EV chargers, the ideal charging times may change.

The Board may wish to consider whether it can create charging hubs for departments that are located near one another, for example departments in downtown Martinez, departments on Douglas Avenue in Martinez. This would allow the County to take advantage of economies of scale associated with wiring and trenching and related costs.

ii. *Personal vehicles*. The number of employees who are using EVs for commute purposes is increasing. A 2017 survey of County employees showed that if the County were to install EV chargers that employees could use at work, many would purchase EVs for personal use.

The County likely will install chargers that are available to the public and employees, as well as chargers that are available only to employees; the new parking lot at 651 Pine Street, for example, is only accessible to County employees who are authorized to park in that lot. The Board should consider whether it wants to make chargers installed for charging County vehicles available to employees to charge their personal vehicles when the chargers are not being used to charge County vehicles. Even though State law allows the County to permit employees to charge personal vehicles at no cost, staff recommends the County have employees pay to charge on County chargers.

For chargers that are installed in publicly accessible lots at County facilities, staff recommends employees be allowed to charge as any member of the public would, and pay associated fees.

For all charging, staff recommends the County implement time limits, price increments, and other strategies to encourage drivers to move their cars so others can charge. The forthcoming toolkit being developed as part of the EV Readiness Blueprint will provide more guidance and policy suggestions on these and related topics.