# Folsom City Council
## Staff Report

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| **MEETING DATE:** | 2/27/2024 |
| **AGENDA SECTION:** | Scheduled Presentations |
| **SUBJECT:** | Presentation by the Public Works Department Regarding Fleet Conversion to Electric Vehicles |
| **FROM:** | Public Works Department |

**RECOMMENDATION / CITY COUNCIL ACTION**

The Public Works Department will give a presentation on California's Advanced Clean Fleet regulations and the impacts on all city departments.

**BACKGROUND / ISSUE**

In September 2020, Governor Newsom signed into law Executive Order N-79-20 to combat climate change by drastically reducing the use of fossil fuels in the transportation industry. To accomplish this, the California Air Resources Board (CARB) was tasked with creating regulations that require all new light-duty vehicles (passenger vehicles up to and including 1/2 ton pickups) sold in the state be zero-emission by 2035, require off-road vehicles and equipment operated in the state be zero-emission by 2035 where feasible, and require all medium and heavy-duty vehicles (3/4 ton pickups and larger) operated in the state be zero-emission by 2045 where feasible. The executive order instructed CARB to develop these regulations with increasing volumes of sales and operations of certain vehicles over time to reach the stated goals.

The regulations created by CARB in response to Governor Newsom's goals include Advanced Clean Cars II, Advanced Clean Trucks and Advanced Clean Fleets regulations. The primary focus of the presentation is Advanced Clean Fleets; however, because these regulations complement each other, details of the other regulations will be briefly reviewed.

Advanced Clean Cars II was approved and implemented in November 2022 and requires a minimum percentage of the annual sales of passenger cars, up to and including most 1/2-ton pickup trucks, from each vehicle manufacturer, to be zero-emission starting with the 2026 model year.

Each year the percentage required increases until model year 2035 when 100% of new light duty vehicles sold in California must be zero-emission.

The Advanced Clean Trucks (ACT) regulations were approved and implemented in June 2020 and require a minimum percentage of annual sales of all vehicles over 8,500 lbs., roughly equivalent to a 3/4-ton pickup truck, from each vehicle manufacturer, to be zero-emission starting with the 2024 model year. These regulations require the minimum percentage of zero-emission vehicle (ZEV) sales in the state to increase annually through 2035. Beginning with model year 2036 the minimum percentage sales required by ACT is superseded by Advanced Clean Fleets which mandates 100% of vehicles over 8,500 lbs. sold be zero-emission. The only direct impact to the city and other jurisdictions from ACT is a requirement to submit a fleet information and utilization report by March 31, 2022, which has been completed and submitted.

The Advanced Clean Fleets (ACF) regulations were approved and implemented on April 28, 2023. The regulations apply to the same vehicles as ACT, class 2b through class 8, except that these regulations apply to fleet owners and operators rather than the manufacturers. The regulations are split into three categories of fleet operators, State and Local Government, High Priority and Federal, and Drayage. The information provided below is specific to sections of the regulations that impact the city of Folsom. The city has the option to comply with the fleet conversion part of the regulations through the standard requirements set forth for local government or can opt to achieve compliance by following the Milestone Option that is outlined for high priority fleets.

1. Standard requirements for State and Local Government:
   a. Fifty percent of Class 2b through Class 8 vehicle purchases must be zero-emission during calendar years 2024 through 2026.
   b. All Class 2b through Class 8 vehicle purchases must be zero-emission beginning in calendar year 2027.
   c. Does not require purchases be made in any given year.

2. Milestone option available in-lieu of the standard requirements:
   a. The city must commit to a specific mandated percentage of the fleet being zero-emission by given calendar year milestones.
   b. Requires full replacement of the City's entire Class 2b-Class 8 fleet by 2039.
   c. Does not restrict percentage of non-zero-emission vehicles purchased in a given year if the milestones are met.
   d. Defines "Useful Life" of vehicles as the first of 18 years or 800,000 miles.

The ACF regulations allow vehicle purchase exemptions under certain circumstances. Categorical exemptions that apply to Folsom include Fire Department vehicles, emergency vehicles equipped with emergency lights and sirens, and two-engine vehicles such as street sweepers. Other exemptions require submittal of a formal request to CARB. CARB must respond within 45 days but if a request is denied there is currently no appeal process.

1. Vehicle exemptions that require a formal request:
   a. Vehicles used for backup that operate less than 1,000 miles per year.
   b. Vehicle types that are not commercially available or technically feasible.

c. Vehicle types that are determined to be unavailable or infeasible through the exemption application process will be added to a list of exceptions with an expiration date for each exemption.
    (a) This list will not include pickups, box trucks, vans, or truck tractors.

Infrastructure construction and electrification extensions are also allowed in some circumstances, but the fleet owner must show that the delay was out of their control. To qualify for an extension based on infrastructure delay the fleet must already have deployed the maximum number of ZEVs the current infrastructure can support. The location also must already have an executed agreement for infrastructure installation and a construction permit issued at least one year before the next compliance deadline. Also, a purchase order must already be in place for the ZEVs so even if the extension is approved, vehicles may have to be stored for long periods before they can be deployed. CARB has 45 days to respond to extension requests and there is currently no appeal process for denied extensions.

Another requirement beginning on January 1, 2024, is that jurisdictions must hire or dispatch ACF Compliant Fleets. This includes any business that operates a fleet to provide their services. Examples include facility repair businesses, equipment rental businesses, construction companies, landscapers, bottled water delivery, and uniform cleaning and delivery. Jurisdictions are responsible for verifying and maintaining compliance information for all hired fleets on an annual basis. In addition, the city must include mandatory disclosure language on all contracts that utilize fleets, including existing contracts.

All the mandates of ACF include extensive record keeping and reporting requirements. In addition to submitting an annual fleet compliance report by April 1 each year through 2045, jurisdictions must report backup vehicle usage information by January 1 each year, and report other events, such as fleet changes within 30 days of occurrence. Each individual department within the city must submit its own report, but compliance requirements may be met jointly for the whole city. The city is required to produce all records, whether previously reported or not, for CARB staff within 72 hours of request for a period of five years.

1. Reporting Information required for Each Fleet Vehicle:
    a. Vehicle information including vehicle identification number, make and model, model year, odometer reading, license plate number and state of issuance, gross vehicle weight rating, body type, and fuel and powertrain type.
    b. Engine family and the engine model year is also required for any vehicles added to the California fleet on or after January 1, 2024.
    c. Vehicle use information including purchase date, deployment date, or date removed from service, and whether the vehicle will be designated under or was purchased pursuant to any exemption or extension.
    d. Funding contract start and end dates for vehicles purchased with California State-funding if the vehicle is to be excluded during the funding contract period as specified by the funding program.
    e. If a vehicle is being replaced pursuant to the ZEV Purchase Exemption specified in section 2013.1(d), the jurisdiction must identify which vehicle is being replaced.

2. Events that require reporting within 30 days:
    a. Adding or removing a vehicle from the fleet.
    b. Backup vehicle mileage that exceeds the allowable limit.
    c. Backup vehicle odometer failures.
    d. Completion of vehicles conversion to a ZEV powertrain.

## ANALYSIS

The City of Folsom fleet, excluding the Fire Department, consists of 447 vehicles, trailers, and pieces of equipment. The ACF regulations and other regulations relating to Governor Newsom's executive order will directly affect the life cycle cost of about 250 of Folsom's existing fleet including impacts on procurement, maintenance, repair, fueling, and sale.

While ACF is the focus of the presentation, Fleet staff have already been working to transition light duty vehicles to electric wherever feasible. These vehicle types already exist in configurations suitable to replace their gas-powered counterparts for some city operations. Of the 12 battery electric vehicles (EV) ordered by the Fleet Division in the past three years, five were canceled by the factory. The other seven have been deployed. Two of the purchases replaced like vehicles, two pickups for two pickups. In this case, the cost was 1.8 times the cost of replacing with like gas-powered pickups, or $135,038 rather than $73,756. This ratio is only expected to increase as we transition medium to heavy duty vehicles to zero-emission. Fleet managers are estimating that the cost of truck replacements subject to ACF will range from 1.5 times to 5 times higher than historical cost for internal combustion engine (ICE) counterparts. The availability of vehicles is also expected to be even more challenging than what we have experienced with light duty.

The city fleet subject to ACF regulations that will need to be replaced with ZEVs includes roughly 170 on-road vehicles that were purchased for $26.3 million. The current replacement cost for like ICEs is $35.2 million but EV replacements bring that estimate to $52.8 million. As currently written, the standard compliance regulations allow the city to decide when replacements are made. If replaced in calendar years 2024 through 2026, up to 50% may be non-ZEV vehicles, but due to the manufacturer sale mandates of ACT, finding non-ZEV vehicles will be increasingly difficult due to increased demand and curtailed production. Also, the ZEV vehicles that are available for the type of application needed in Folsom are almost all prototypes and have not been proven to perform like their ICE counterparts. Beginning January 1, 2027, 100% of class 2b through class 8 vehicles purchased by the city must be ZEV.

Maintaining and repairing electric heavy-duty vehicles will also present challenges. The city's current fleet shop does not have adequate space to work on high-voltage systems, nor do staff have the appropriate training. Both will need to be remedied to Occupational Health and Safety Administration standards before the electrical systems can be worked on in-house. Until then, all work involving the electrical system will need to be sublet to shops who have that capability. Regional resources for this type of work have not yet been identified and a lack of local repair facilities is not adequate justification for exemptions.

The city does not have cost history for maintaining this type of vehicle. Based on current non-ZEV vehicle chassis/body maintenance cost ratios, however, staff estimates that the heavy-duty ZEV chassis will show a minor reduction in maintenance costs, while the body of ZEV heavy duty vehicles will have no reduction in maintenance costs. This is because the bulk of the city's heavy-duty vehicle chassis maintenance costs are generated by 90-day inspections mandated by California Highway Patrol, which will not change based on a change of motive power. The body maintenance costs will not change since the form, function, and design remain the same.

While maintenance costs are not expected to substantially change, repair costs are anticipated to be much higher. Industry wide anecdotal evidence from fleet managers who have some experience with heavy-duty EV conversions, primarily from navigating bus electrification, indicates that repair costs outside of warranty coverage can be substantially higher than non-ZEV vehicles, often costing more than the value of the vehicle. Increased costs are especially notable in the case of accident damage repair and battery replacement.

To comply with ACF the city will have to invest in charging infrastructure for city fleet vehicles; this is above and beyond any public charging infrastructure. The Public Works Department has contracted with an engineering firm to design infrastructure for the Corporation Yard and the design is nearly complete. Procurement of a contractor will follow, and construction costs will be determined at that time. Public Works is not aware of any other departmental planning for heavy-duty charging infrastructure at this time. Separate from ACF, and in preparation for light duty electrification mandated by the executive order, Fleet staff recently worked with a SMUD contractor who provided a preliminary estimate of $4 million for infrastructure cost across the six city owned facilities where vehicles are housed. Charging ability is required at all locations because charging electric vehicles to meet city operational needs may take up to 15 hours, compared with about 15 minutes to fuel even the largest of fuel tanks currently used. This forces the city to decentralize "fueling" so that departments can recharge during non-working hours at each of their depots. The estimates are based on current fleet sizes and usage, not including off-road equipment, and not accommodating any public access to the chargers.

1. Parks Maintenance – 68 Clarksville Road (between FS37 and Sports Complex)
    a. Minimum estimate nineteen level 2 chargers needed.
    b. Minimum estimated installation cost $350,000.
2. Municipal Landscaping – 401 Stafford Street
    a. Minimum estimate six level 2 chargers needed.
    b. Minimum estimated installation cost $165,000.
    c. This site is expected to support charging Library vehicles as well.
3. Police Department – 48 Natoma Street
    a. Minimum estimate eleven DC fast chargers and nineteen level 2 chargers needed.
    b. Minimum estimated installation cost $2.2 million.
4. Corporation Yard – 1300 Leidesdorff Street
    a. Minimum estimate thirty level 2 chargers needed.
    b. Minimum estimated installation cost $650,000.
5. Water Treatment Plant – 194 Randall Drive
    a. Minimum estimate fifteen level 2 chargers needed.

b. Minimum estimated installation cost $340,000.

6. City Hall – 50 Natoma Street
    a. Minimum estimate twenty-five level 2 chargers needed.
    b. Minimum estimated installation cost $305,000.
    c. This site is expected to support charging for the Zoo, Senior Center, and Community Center vehicles as well.

Regarding the cost of charging in comparison to fueling, the expectation is that initially there will be a savings per mile to charge EVs rather than using fuel; however, fleet staff caution the city not to rely on this savings for long term planning. As EV adoption grows throughout the state, the increased demand for electricity may drive up costs. In addition, assessments that show significant saving for electricity over fuel sometimes include assumptions that Low Carbon Fuel Standard (LCFS) credits have been accumulated and used to offset electricity cost. These assumptions can be misleading as LCFS credits are traded on the open market and prices vary. For example, over the past three years LCFS credits have been trending downward significantly:

1. Average price per LCFS credit
    a. Calendar Year 2021 - $187.
    b. Calendar Year 2022 - $125.
    c. Calendar Year 2023 - $75.

Another challenge in determining the ongoing cost of electric vehicles is the lack of historical data to use for determining lifecycle cost. A primary function of fleet management is to determine the optimum replacement points for vehicles, which estimates the optimum replacement timing, in either miles or engine hours, and time, to achieve the lowest average annual cost. To calculate the optimum replacement point, the fleet manager will use purchase date and projections for resale value, finance costs, maintenance costs, repair costs, and downtime costs over the next 10 years. The optimum replacement point is where depreciation meets the cost of ownership. The depreciation of a vehicle includes two significant drops in resale value, once immediately after purchase, and another when a major repair is required that lowers what a surplus buyer is willing to pay.

Once the optimum replacement point has been established, the whole life cycle cost can be determined. Additional data used to determine life cycle costs are straight line annual depreciation to an anticipated residual; finance or opportunity costs; operating expenses like basic maintenance and repairs; and fixed costs like insurance, wages, license, inspections, emissions testing, and taxes. The whole life cycle cost is used to project annual cost for the vehicle/equipment and determine how much of this cost is based on actual utilization versus overhead.

The best management practices would be to use a Fleet Management Information System to develop whole life cycle costs, then use this information to establish a charge out rate, also known as a use rate, to the department. Using this strategy, appropriate recovery of costs can be collected in a vehicle replacement reserve fund to replace vehicles at the optimum time. Also, the fleet manager would be able to provide annual maintenance and reserve budgets.

For traditional internal combustion engine vehicles and equipment, determining the optimum replacement point and life cycle cost has relied on a wealth of historic and ongoing data sources, particularly the robust resale and parts markets that exist for these vehicles and equipment. Historical data of this type for ZEVs is extremely limited to nonexistent, making the calculations of optimum replacement points and life cycle cost analysis almost impossible, and as a result, annual budgets and replacement reserves are also not predictable at this time.

The medium to heavy duty fleet requirements of ACF are only the beginning of electrification mandates that will impact the city of Folsom. To meet the goals of Governor Newsom's executive order, the city will also need to replace roughly 50 on road light duty vehicles and about 20 off-road pieces of equipment by 2035. None of the off-road and many of the light duty vehicle replacements are not yet available in the configurations needed. The city is currently allowed to purchase non-ZEVs in these categories; however, replacements are becoming increasingly difficult to find due to increased demand and curtailed production. The original purchase price of vehicles in these categories is $3.2 million and the estimated replacement cost for non-ZEV replacements is $4.9 million. A preliminary estimate to replace all of these vehicles and equipment with ZEV is $9 million.

To comply with ACF, staff recommend using the standard compliance method which enables the city to determine when existing vehicles are replaced, rather than having to meet a minimum quota within the fleet each year. The city must still meet the minimum 50% ZEV quota of total vehicles purchased. Decentralized purchasing throughout the city increases the possibility of non-compliance and departments should consult with the Fleet Manager prior to all purchases. Staff also recommend departments consider these regulations and consult with the Fleet Division before disposing of any existing vehicles or equipment. While the cost of compliance is unknown, the initial investments will need to include staff to administer the program and infrastructure, so the city is ready to receive electric vehicles when replacements become inevitable.

Submitted,

Mark Rackovan, Public Works Director

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