



# RIVERSIDE PUBLIC UTILITIES

## Board Memorandum

**BOARD OF PUBLIC UTILITIES**

**DATE: SEPTEMBER 23, 2024**

**SUBJECT: CITY OF RIVERSIDE ZERO-EMISSION VEHICLE FLEET TRANSITION PLAN**

**ISSUES:**

Receive a presentation from Black & Veatch Corporation on the City of Riverside's Zero-Emission Vehicle Transition Plan.

**RECOMMENDATION(S):**

That the Board of Public Utilities receive a presentation on the Zero-Emission Vehicle Transition Plan study conducted by Black & Veatch.

**LEGISLATIVE HISTORY:**

Newly enacted regulations aim to protect the health and well-being of Californians by improving air quality and mitigating the harm posed by greenhouse gas emissions as well as other air contaminants associated with transportation.

**California Advanced Clean Fleet Rule**

The Advanced Clean Fleets (ACF) Rule was adopted by the California Air Resources Board (CARB) to transition the State's medium and heavy-duty fleet sectors to zero-emission vehicles (ZEV) in support of California's air, climate and transportation goals. CARB unanimously adopted the ACF Rule in April 2023, following a three-year rule development process, and the rule went into effect on October 1, 2023. The ACF Rule requires fleets that are well-suited for electrification to reduce emissions through requirements to phase-in the use of ZEV for target fleets and requires that manufacturers only manufacture ZEV trucks.

Under the ACF Rule, starting January 1, 2024, State and local governments must ensure that 50% of their annual medium and heavy-duty vehicle purchases per calendar year are ZEV. By January 1, 2027, this requirement increases to 100% of new vehicle purchases being ZEVs.

**California Advanced Clean Cars II Rule**

The Advanced Clean Cars Rule was adopted by CARB in 2022 and places requirements on new vehicles sold in California for model years 2026 through 2035. Like the ACF, this rule supports California's air, climate and transportation goals. While the rule will phase in over the stated decade, by 2035 all new passenger cars, trucks, and sport utility vehicles sold in California will be

required to be zero-emission (plug-in electric or hydrogen fuel cell electric ZEVs). The Advanced Clean Cars II regulations aim to rapidly scale down light-duty passenger car, pickup truck and SUV emissions, improving air quality.

These regulations address mobile sources, which are the greatest contributor to emissions of criteria pollutants and greenhouse gas emissions (GHG) in California, accounting for about 80-percent of ozone precursor emissions and approximately 50-percent of statewide GHG emissions, when accounting for transportation fuel production and delivery. California suffers some of the worst air pollution in the nation. The South Coast air basin is one of two regions in the country classified as “extreme” – the worst category for nonattainment of the federal ozone standard of 70 parts per billion. The suite of regulations with Advanced Clean Fleet and Advanced Clean Cars, which include the Zero-Emission Vehicle regulation, are an integral part of California’s strategy to address these pressing public health needs. Reducing emissions contributes to decreasing the severity of their impacts. In addition, reducing the emissions that cause climate change will lead to greater reductions in ozone from the efforts to reduce the pollutants that cause it, which are primarily oxides of nitrogen (NOx) and hydrocarbons (HC) from fuel combustion. These emission reductions will help stabilize the climate, improve air quality locally, and reduce the risk of severe drought and wildfire and its consequent fine particulate matter pollution.

## **BACKGROUND:**

The City of Riverside’s Envision Riverside 2025 Strategic Plan establishes goals for reducing greenhouse gas emissions and improving air quality. Transitioning the City’s fleet to zero emission vehicles is specifically identified as a goal and an action item in order to improve air quality and reduce greenhouse gas emissions.

On September 6, 2023, the General Services Department, in conjunction with the Purchasing Division, issued Request for Proposals (RFP) No. 2316 on the City’s Electronic Bidding System, PlanetBids Vendor Portal, seeking a qualified company to provide a comprehensive system wide assessment of ZEV needs for the City and to recommend a strategy for a phased vehicle purchase and replacement process, inclusive of necessary fueling and charging infrastructure. The notification was sent to 716 City of Riverside vendors and 500 external vendors.

With a total of 31 prospective bidders, the RFP closed on October 4, 2023, with a total of 8 proposal submissions deemed responsive and responsible. A cross departmental team from General Services, Public Works and Public Utilities reviewed the proposals for qualifications (35%), experience with projects of similar size and scope (30%), pricing (15%), professional references (10%), approach and methodology (10%) and Black & Veatch Corporation (Consultant) was the highest-ranking firm.

On January 22, 2024, the Board of Public Utilities recommended that the City Council approve a Professional Consultant Services Agreement with Black & Veatch Corporation, of Overland Park, Kansas for zero-emission fleet transition plan services in the amount of \$99,600, funded in part by the Office of Sustainability as well as the Central Garage 650 Fund and Public Utilities based on proportional share of their respective fleets.

On January 23, 2024, the City Council approved a Professional Consultant Services Agreement with Black & Veatch Corporation, of Overland Park, Kansas for zero-emission fleet transition plan services. The term of the agreement is from February 1, 2024, through February 1, 2025, for a total contract amount not-to-exceed \$99,600.

## **DISCUSSION:**

The City of Riverside's situation calls for the development of a cost-effective plan to transition vehicles to zero-emission that complies with CARB and other regulations, supports achievement of Climate Action Plan objectives, and positions the City to continuously meet its diverse operational requirements. The City has a wide variety of medium-duty and heavy-duty vehicles and equipment meeting the gross vehicle weight rating (GVWR) of 8,500 pounds or greater, which makes them subject to ACF regulations. Over the next 10 to 20 years, these vehicles will need to be phased from internal combustion engine (ICE) technology to zero-emission status. This will require an effective transition plan and associated understanding of the charging or fueling infrastructure that will be needed.

To assist the City of Riverside with this planning effort, the ZEV Fleet Transition Plan study was initiated with Black & Veatch Corporation (Consultant) in February 2024, with a cross-departmental City team including representatives from the City Manager's Office of Sustainability, General Services, Riverside Public Utilities, and Public Works.

The objectives of the Zero-Emission Fleet Transition Plan include:

1. Fleet Assessment: Evaluate zero-emission alternatives, define vehicle replacement schedule and purchase costs.
2. Charging and Facility Needs: Determine charging infrastructure and facility requirements and costs to support electric load growth.
3. Total Cost of Ownership: Calculate total cost of ownership of the fleet through 2040.
4. Deployment Options and Timelines: Propose fleet transition deployment options and timelines through 2040.

### **City Fleet Assessment**

The City owns a large and diverse fleet in terms of fuels, vehicle configurations and parking locations. Excluding public safety emergency response vehicles which are exempt under the ACF, the City's fleet consists of 701 vehicles with 53% of the total fleet governed by CARB Advanced Clean Fleet (ACF) Regulations.

- Three hundred and seventy-three (373) fleet vehicles meet the GVWR of 8,500 pounds or greater and are subject to ACF regulations. These vehicle types include vans, refuse trucks, street sweepers, utility service trucks, bucket trucks, dump trucks, flatbed trucks, work pickup trucks, semi-trucks, vacuum trucks, tank trucks, and paint strippers.
  - ZEV alternatives are currently available for some, but not all of these medium and heavy-duty vehicle types. If the City cannot comply with ACF requirements to purchase a ZEV because a ZEV alternative for that vehicle type does not exist, beginning in 2025, it's anticipated that the City will be able to request an exemption under CARB's ZEV Purchase Exemption List.

- Two hundred and ninety-four (294) fleet vehicles are exempt from ACF regulations. These light-duty vehicle types include sedans, sports utility vehicles (SUVs), and light-duty pickup trucks.
  - Beginning in 2035, 100% of in-State sales of new light-duty passenger cars and trucks will be ZEV.
- 34 paratransit buses are subject to Innovative Clean Transit (ICT) regulations enacted by CARB, rather than ACF. ICT regulation requires all public transit agencies to transition to 100% ZEV fleet by 2040.

### Underutilized Fleet Vehicles

Identification of underutilized vehicles is a vital component to maintaining an optimized fleet size and composition to meet the City's operational needs.

- A total of 48 underutilized vehicles were identified, with 17 showing zero annual miles for the previous year, and 31 showing under 10% utilization, i.e. very low mileage. Underutilization is attributable to a variety of reasons including vehicle condition, or unavailability of parts, reserve status awaiting replacement, or low usage due to specialized, seasonal or on call use.

All surplus vehicles have been removed from the active vehicles database because these vehicles are no longer needed or usable by the holding department and are in the process of being sold.

The Fleet Services Division will continue to work with departments to review, investigate and better understand reasons for a vehicle being inactive or underutilized. This understanding will help guide future replacement decisions for an optimally sized fleet.

### ZEV Suitability for City Fleet

Approximately one-third of the City vehicle types subject to ACF regulations have low ZEV alternative suitability, due to either ZEV range limitations, payload capacity, gross vehicle weight rating suitability, configuration to meet the required height, weight, length and vocational body of current fleet vehicles, or market availability.

- High ZEV alternative suitability: Sedan, SUV, Pickup Truck, Paratransit Bus, Van, Heavy Duty Semi Truck, Refuse Truck. Electric (EV) alternatives will meet operational requirements and should present no significant concerns.
- Medium ZEV alternative suitability: Work Pickup Truck, Street Sweeper, Dump Truck, Heavy-Duty Utility Truck, Flatbed Truck, Medium-Duty Utility Truck, Medium-Duty Bucket Truck. There are few original equipment manufacturers for these vehicle types; however, a ramp up in the market is expected due to high market demand.
- Low ZEV alternative suitability: Vacuum Truck, Tanker Truck, Construction Materials Truck, Paint Striper Truck, Heavy-Duty Crain. No ZEV alternatives are on the market to meet operational requirements.

In instances where a suitable ZEV alternative is not commercially available, the City may need to apply for ACF Exemptions until suitable alternatives enter the market. Additionally, City staff will monitor the market for vehicle manufacturer announcements, and potentially engage manufacturers to pilot vehicles to help accelerate the market and become an early adopter.

ZEV Alternatives Assessment: Electric vs. Hydrogen

In evaluating available ZEV vehicle types, the Consultant’s recommendation is that the City select electric, rather than hydrogen vehicles due to lower purchase price and infrastructure costs, combined with availability of vehicle models to meet the City’s operational needs. While hydrogen fuel cell vehicles have many benefits, such as longer vehicle ranges and shorter refueling times, they lag far behind electric vehicles in terms of market availability and fueling infrastructure. Furthermore, limited hydrogen vehicle availability results in lack of data to accurately model total cost of ownership when compared to electric vehicles. This may change over time and the City should continuously consider the various options to move forward with. Hydrogen transit busses and some Class 8 trucks in addition to light duty vehicles are commercially available and it is expected that this technology will continue to develop rapidly over the next several years.

Charging Infrastructure and Facility Requirements

The City’s fleet is housed at five primary locations, which will require installation of EV charging infrastructure and electrical capacity upgrades to support the projected 2040 ZEV fleet composition. The primary sites are: the Utilities Operation Center (UOC), POE, City Hall, Corporation Yard, and the Public Works/Regional Water Quality Control plant. Black & Veatch determines that the addition of EVs to the City fleet will result in a **projected increase of 6,450-kW in City-wide load demand to be served by 127 EV chargers**. Total City-wide infrastructure costs are estimated at \$10.3M.

**Table 1. Estimated Infrastructure Costs**

Site	No. of Chargers	Est. Cost	EV Load Addition
Corporation Yard	45	\$ 5.020M	3,174 kW
RPU UOC	38	\$ 3.091M	2,434 kW
City Hall	26	\$ 1.056M	450 kW
RPU POE	15	\$ 679k	272 kW
PW Water Quality	3	\$ 328k	120 kW
Totals:	127	\$ 10.174M	6,450 kW

As reflected in Table 1., RPU is estimated to incur \$3.77M in total infrastructure costs for the UOC and POE sites.

Vehicle Replacement Costs

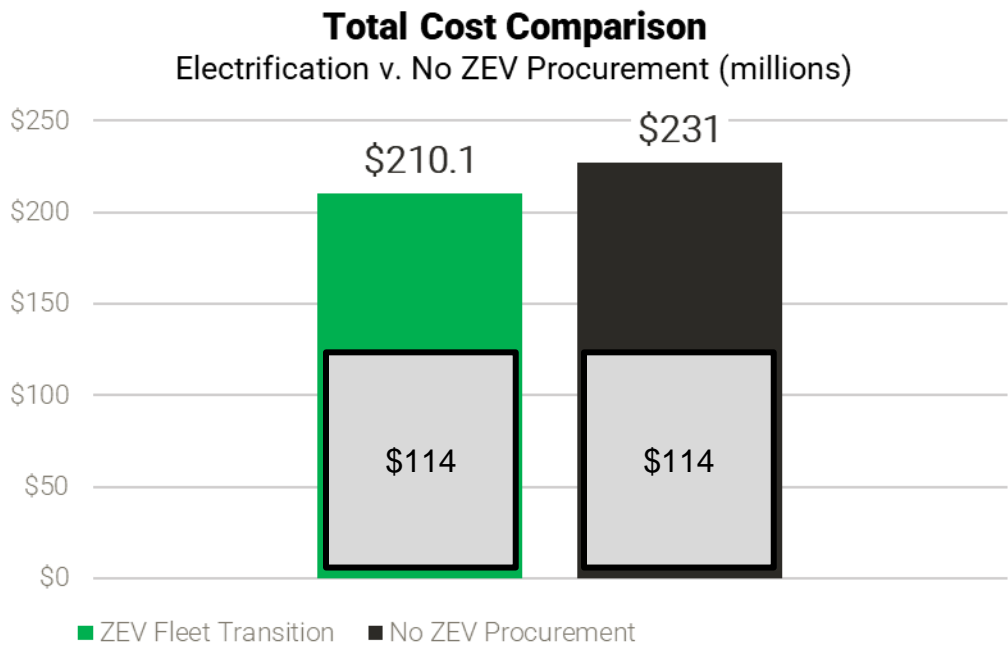
The City operates 701 vehicles, with 53% of the total fleet governed by CARB Advanced Clean Fleet (ACF) regulations. The City’s existing vehicle replacement schedule will result in transitioning **245 vehicles (35% of the fleet) to EVs** at an estimated cost of \$38.9M in vehicle purchase costs, before incentives for EVs, and \$12.3M for non-EVs that are replaced during the initial 50% requirement years, including those that lack a suitable zero-emission alternative and are presumed to qualify for exemption. An additional \$10.14M will be incurred for vehicles that are not regulated by CARB ACF, including transit buses and passenger vehicles, for a total of **\$61.34M in vehicle purchase costs by 2040**.

RPU’s vehicle replacement plan in this study results in **transitioning 93 vehicles (35% of the fleet) to EVs** through 2040 at two primary vehicle storage sites, the UOC and POE. The \$61.34M in total vehicle purchase costs includes RPU’s estimated \$11.9M (before incentives) for vehicles that are CARB ACF-regulated. Through 2040, RPU’s vehicle purchase costs include \$10.1M for EVs and \$1.8M for non-EVs that are replaced during the initial 50% requirement years and those that lack a suitable zero-emission alternative, which are presumed to qualify for exemption. RPU is estimated to incur an additional \$2M in purchase costs (before incentives) for vehicles that are CARB-ACF Exempt, for **total estimated vehicle replacement costs of \$13.9M**.

Total Cost of Ownership

Transitioning the City fleet to ZEV results in \$210.1M total cost of ownership for the City’s fleet, a \$21M (9%) cost savings versus a status-quo scenario with no ZEV procurement. Total cost savings are largely influenced by forecasted cost declines in EV battery and powertrain, EV maintenance costs projected at 40 – 60% lower than ICE vehicles, as well as forecasted increases in costs for ICE vehicles (especially following 2030), gasoline and diesel.

**Table 2. Total Cost Comparison**



Notes:

1. ZEV Fleet Transition produces \$96.1M in incremental transition costs while No ZEV Procurement results in \$117M.
2. \$114M of total costs are for operating and maintaining existing vehicles in the fleet that are not scheduled to be replaced or transitioned during the study period.
3. EV incentives and rebates are included (Total: \$3.2M), including \$2.3M for CARB-ACF regulated vehicles and \$916.5k for CARB-Exempt vehicles.

Included in the \$210.1M figure above, **RPU is estimated to incur \$62.1M in total ownership costs** to purchase and maintain its electric and non-electric fleet through 2040.

### Deployment Options and Timelines

Under the ACF, there are two compliance pathway options available to the City: 1) the Model Year Schedule (Default) which became effective January 1, 2024, which requires 50% of annual vehicle purchases per calendar to be ZEV, increasing to 100% of annual vehicle purchases starting January 1, 2027; or 2) the ZEV Milestone Option, wherein fleet owners phase ZEVs into their fleet based on the body type of the vehicle.

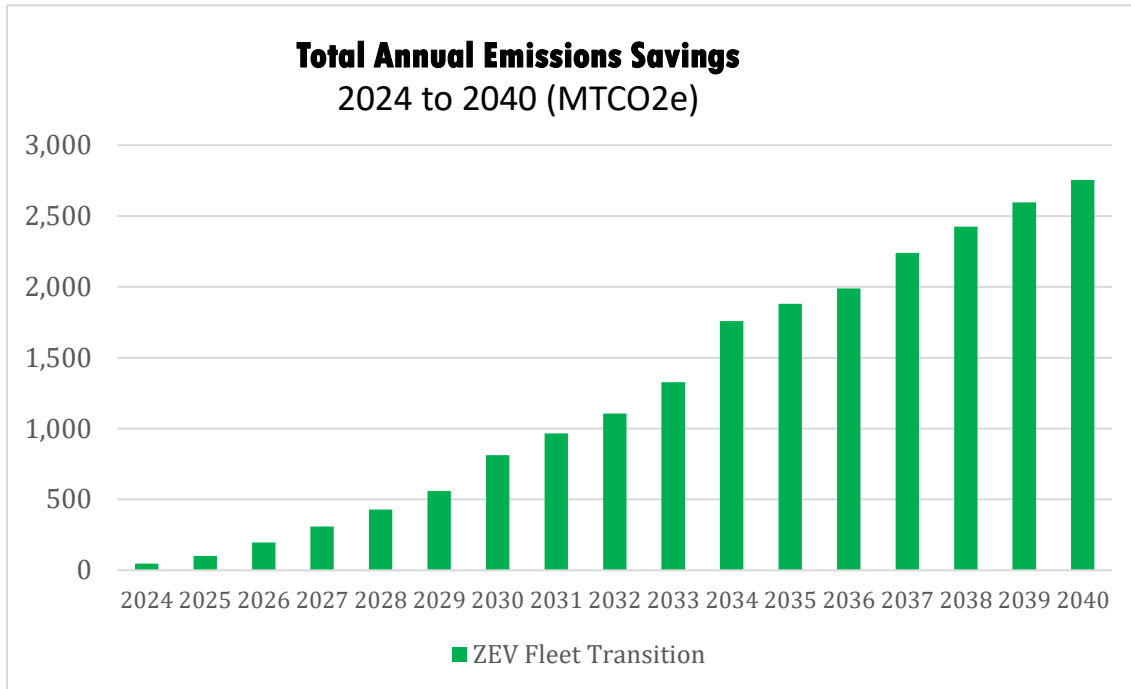
- Option 1 **Model Year Schedule** is driven by existing fleet replacement schedules and vehicle mileage, and ultimately results in fewer ZEV purchases. Under this option, existing vehicles are not taken out of service and replaced before the end of useful life. The Pros include a gradual transition as the City can phase-in ZEVS over time, flexibility as ICE vehicles can continue to be used until they reach the end of their useful life, and a predictable timeline. The cons include limited ZEV adoption as the City would not fully transition to ZEVs by 2040.
- Option 2 **Milestone Option** is offered as a one-time option until 2030. The Milestone Option is driven by established years to convert portions of fleet and categorizes fleet vehicles into groups by body type, with ZEV percentage requirements per year. The milestone schedule drives the replacement schedule, resulting in more ZEV purchases as fleet vehicles would be retired and replaced years before they would otherwise need to be replaced, in order to meet ZEV fleet composition requirements. The Pros include faster transition as the City would commit to specific ZEV fleet milestones by certain dates. The Cons include challenges meeting milestones and higher upfront costs.

The City plans to comply with CARB ACF regulations through **Option 1 to provide greater flexibility and avoid vehicle replacements prior to end-of-life.**

### Emissions Reductions

Electric vehicles (EVs) produce no direct emissions from their tailpipes, unlike conventional vehicles with internal combustion engines (ICEs). EVs are also more energy efficient than gasoline vehicles. They can use efficient electric motors and plug into a grid that uses more renewable energy sources, which don't release greenhouse gas emissions into the atmosphere. Black & Veatch estimates that electrifying the City's fleet results in total scope 1 (i.e. tailpipe emissions) and scope 2 emissions (derived from RPU as power generator source) reductions of 21,495.1 metric tons of carbon dioxide equivalent (MTC02e) by 2040, equivalent to approximately 50k barrels of oil consumed.

**Table 3. Total Annual Emissions Savings**



The City’s transition to zero emission vehicles is likely to be a complex, long-term undertaking that will require considerable flexibility in contracting, procurement, and where possible, funding sources and availability. The Zero-Emission Fleet Transition Plan provides a roadmap for deployment and budgeting for future costs to ensure full compliance with CARB Advanced Clean Fleet regulations and a cleaner future for Riverside residents.

**STRATEGIC PLAN ALIGNMENT:**

The Zero Emission Fleet Transition Plan project supports Strategic Priority Environmental Stewardship, and Goal 4.6 to Implement the requisite measures to achieve citywide carbon neutrality no later than 2040.

This item aligns with *EACH of the five Cross-Cutting Threads* as follows:

1. **Community Trust** – The Professional Consultant Services Agreement with Black & Veatch Management Consulting, LLC for Zero Emission Fleet Transition Plan services was agendized for the Board of Public Utilities and City Council consideration, ensuring public transparency.
2. **Equity** – The Zero Emission Fleet Transition Plan will benefit the entire Riverside community by providing a road map for reducing greenhouse gas emissions and improving air quality.
3. **Fiscal Responsibility** – RFP No. 2316 for Zero Emission Fleet Transition Plan services was competitively bid in compliance with City Purchasing Resolution, ensuring the best value for these services was obtained.
4. **Innovation** – The Zero Emission Fleet Transition Plan will ensure that the City of Riverside



remains a leader in the areas of Green Fleet and environmental stewardship.

- 5. Sustainability & Resiliency** – The Zero Emission Fleet Transition Plan will help to reduce greenhouse gas emissions for a more sustainable future.

**FISCAL IMPACT:**

There is no fiscal impact with this report. However, implementation of the City’s Zero-Emission Fleet Transition Plan is estimated to produce approximately \$96.1M in incremental transition costs for vehicles and infrastructure through 2040, partially offset by rebates and reduced operations and maintenance costs for zero-emission vehicles.

	<b>Estimated Cost</b>
EV Infrastructure	\$ 10,310,000
ACF Vehicle Purchases	51,200,000
Non-ACF Vehicle Purchases	10,100,000
ACF Rebates	(2,300,000)
ICT Rebates	(846,000)
Light Duty Vehicle Rebates	(70,500)
Operations and Maintenance	<u>27,706,500</u>
Total:	\$ 96,100,000

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Attachments: Presentation