Agenda Item #3.2
For Council Meeting of: April 2, 2019

CITY OF SANTA ROSA
CITY COUNCIL

TO: MAYOR AND CITY COUNCIL
FROM: RACHEL EDE, DEPUTY DIRECTOR OF TRANSIT
YURI KOSLEN, TRANSIT PLANNER
TRANSPORTATION AND PUBLIC WORKS DEPARTMENT
SUBJECT: CITYBUS FLEET ELECTRIFICATION

AGENDA ACTION: STUDY SESSION

RECOMMENDATION

This item is provided for Council's information only and no action will be requested.

EXECUTIVE SUMMARY

The Transit Division's largest ongoing capital obligation is the periodic replacement of the 28 fixed-route buses in its active fleet. With the developments in the Zero Emissions Bus (ZEB) industry and the California Air Resources Board's (CARB) Innovative Clean Transit (ICT) regulation requiring statewide transit bus electrification by 2040, the timing to begin the transition from diesel vehicles to electric buses is optimal. This transition requires collaboration with state and local partners and a comprehensive understanding of the electrification process. This study session will provide an overview of the Transit Division's fleet electrification activities and allow Council to provide feedback to staff on CityBus's fleet plan and anticipated electrification timeline in light of fiscal, regulatory, and infrastructure-related factors.

BACKGROUND

Reducing the transportation sector's reliance on petroleum is a key component of a statewide effort to reduce greenhouse gas emissions, strengthen the economy, and improve public health and the environment. According to the Sonoma County Regional Climate Protection Authority's analysis in the *Climate Action 2020* plan, on-road transportation is responsible for generating the most greenhouse gas emissions within Sonoma County. Although the most significant portion of Sonoma County on-road transportation emission is attributed to single occupancy vehicles, replacing a CityBus diesel bus with a zero-emissions bus is the equivalent of replacing five personal automobiles on Sonoma County roads.

Zero-emissions buses (ZEBs) are buses with zero tailpipe emissions and include battery-electric buses (BEBs) and hydrogen fuel cell buses. The efficiency and availability of BEB technology, combined with lower upfront capital costs and the potential for lower operating costs, allow BEB technology to be more easily implemented than fuel cell technology at this time. BEB life-cycle greenhouse gas, NOx, and particulate matter emissions are significantly less than both diesel and CNG bus emissions. Ultimately, BEB "well to wheel" emissions depend on how electricity for the grid is produced. With the inception of Sonoma Clean Power in 2014, a shift to BEBs allows for a reliance on a portfolio of cleaner low emissions electricity.

With the California Air Resources Board's adoption of the Innovative Clean Transit (ICT) rule (13 CCR § 2023) on December 14, 2018, California became the first state in the country to mandate transit fleet electrification. The ICT regulation requires every California transit agency to submit a Zero Emission Bus Rollout Plan approved by governing board by July 2023, and fully transition to zero-emission buses by 2040. Starting in 2026, smaller transit agencies like CityBus will be required to have 25% of each bus purchase be ZEBs, increasing to 100% by 2029.

Battery-electric buses are widespread in Asia and Europe, and in the U.S. there are currently 655 BEBs in use at 78 public transit agencies and university. In California, as of May 2018 there were 110 BEBs in operation with another 626 BEBs on order or planning to be ordered by transit agencies. Sonoma County Transit began operating the first battery-electric bus in the County on its local service in Sebastopol on December 2018.

Currently, CityBus' active fixed-route fleet is composed of 18 diesel buses and 10 diesel-hybrid buses. In the past year the City of Santa Rosa has received two competitive grant awards from the Federal Transit Administration's 5339 Bus and Bus Facilities Program totaling $2.9 million. These funds will pay for CityBus' first four battery-electric buses and charging equipment.

PRIOR CITY COUNCIL REVIEW

On October 23, 2018, zero-emissions buses were discussed during a Council study session reviewing progress implementing the City's Climate Action Plan.

On May 23, 2017 and June 5, 2018, the City Council approved the Transit Division's applications for FY 17 and FY 18 funds from the Federal Transit Administration's 5339 program for battery-electric buses and chargers.

ANALYSIS

Infrastructure Considerations

Transit fleet electrification is a complex process that requires not only the funding and purchase of electric buses, but the development of the infrastructure to provide vehicle charging that meets the duty cycle needs of the transit network. This can require significant upgrades to the electrical infrastructure serving the charging site in addition to purchase and installation of chargers. Decisions must also be made as to the method of charging used—depot charging (typically occurring overnight), or "en route" (charging at transit centers during the course of a vehicle's service day)—and how infrastructure improvements will be funded and phased in as the size of the electric fleet grows.

To better understand the grid and infrastructure upgrades necessary to support the charging for the four BEBs that have been funded by federal grants, CityBus staff reached out to PG&E, Sonoma Clean Power, the Regional Climate Protection Authority (RCPA), and Sonoma County Transportation Authority (SCTA). This coordination has resulted in an effort to implement a regional approach to BEB deployment (among Santa Rosa CityBus, Sonoma County Transit, Petaluma Transit and the Mendocino Transit Authority) that would involve development of a needs assessment laying out short and long-term infrastructure needs and costs for BEB deployment in Sonoma and Mendocino Counties.

Additionally, PG&E is expected to launch the Fleet Ready Program in Spring 2019. This program will provide $236 million over five years to upgrade the grid and provide a connection to chargers for heavy duty fleets, as well as a 50% contribution to the cost of vehicle chargers for transit agencies. During the regular Council meeting on January 29, staff will seek authorization from the Council to apply for this program.

Vehicle-Related Considerations

Purchasing battery-electric buses involves analysis of the specific route characteristics and operating environment in which the vehicles will be deployed. Factors such as grades, passenger load, and HVAC use can have significant impacts on the actual vehicle range on a single charge, and therefore the battery capacity required and cost of the bus. Because the capital cost of purchasing battery-electric buses is much higher than diesel buses at this time, integrating more expensive battery-electric buses into a transit fleet adds complexity to fleet replacement planning. The base cost of a 40' battery-electric bus can be as much as $200,000-$300,000 more than that of a diesel bus.

Although purchasing electric vehicles and installing charging infrastructure will require an increase in CityBus' capital program, recent analysis suggests that over time operating costs will be lower for battery-electric buses than for diesel buses. BEB operating costs are heavily dependent on utilities' demand charging rates. PG&E has recently proposed a new commercial electric vehicle rate structure to the California Public Utilities Commission that promises to reduce charging costs to a level below the

diesel fuel equivalent. Because BEBs have fewer moving components, regenerative braking, and no oil systems, maintenance costs have been found to be lower than those for diesel buses. The cost of the battery replacement in BEBs is the primary maintenance concern, but this concern can be mitigated through warranty and battery lease programs offered by manufacturers.

Transit Fleet Plan

At this time, CityBus' capital program places priority on replacement of vehicles that have exceeded their useful life by several years and are both costly to maintain and less reliable than newer buses. Federal useful life for 40' transit buses is 12 years; however, CityBus currently operates buses with useful life in excess of 17 years in its active fleet. Integration of electric vehicles into the fleet replacement plan will require additional local match resources and new grant funding to augment federal formula funds if CityBus is to achieve its goals for timely bus replacement. CityBus has been fortunate to receive two federal awards totaling $2.9 million to purchase its first four battery-electric buses and plans to take advantage of state incentives for zero-emissions bus purchases, including the California Air Resources Board's Hybrid and Zero-Emissions Truck and Bus Voucher Incentive Program (HVIP).

Due to the higher costs of purchasing electric vehicles and the need to ensure adequate charging infrastructure and capacity as the electric fleet grows in size, Transit Division staff have developed an initial five-year plan for bus replacement. This will enable the Division to plan for its next two bus purchases while conducting a needs assessment for charging infrastructure to better understand the costs, phases, and timelines associated with build-out of that infrastructure.

Over the next five years the Transit Division anticipates replacing seven to eight fixed-route vehicles by completing a four-bus electric bus purchase (to move forward this year), as well as a three to four bus diesel purchase. These bus purchases will replace 2002 and 2008 model-year buses and enable the Division to bring the fleet up to date on bus replacement. Depending on the costs and phasing associated with implementation of charging infrastructure and funding levels for formula and competitive grants, it may be possible to procure a higher number of electric buses and fewer diesel buses within this five-year time frame.

Transit staff anticipate returning to Council following the infrastructure needs assessment to report on infrastructure implementation and longer-range bus purchase plans (for model years 2011 and beyond) with the goal of formally adopting a transit fleet electrification plan.

FISCAL IMPACT

There is no fiscal impact related to this study session.

ENVIRONMENTAL IMPACT

This action is exempt from the California Environmental Quality Act (CEQA) because it is not a project which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, pursuant to CEQA Guideline section 15378.

BOARD/COMMISSION/COMMITTEE REVIEW AND RECOMMENDATIONS

Not applicable.

NOTIFICATION

Not applicable.

ATTACHMENTS

None.

CONTACT

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