

To: Operations & Scheduling Committee

Date: 5/30/2024

From: Marcel Longmire, Director of Maintenance

Reviewed by: *WC.*

**SUBJECT: Battery Electric Bus Availability and Cost Update**

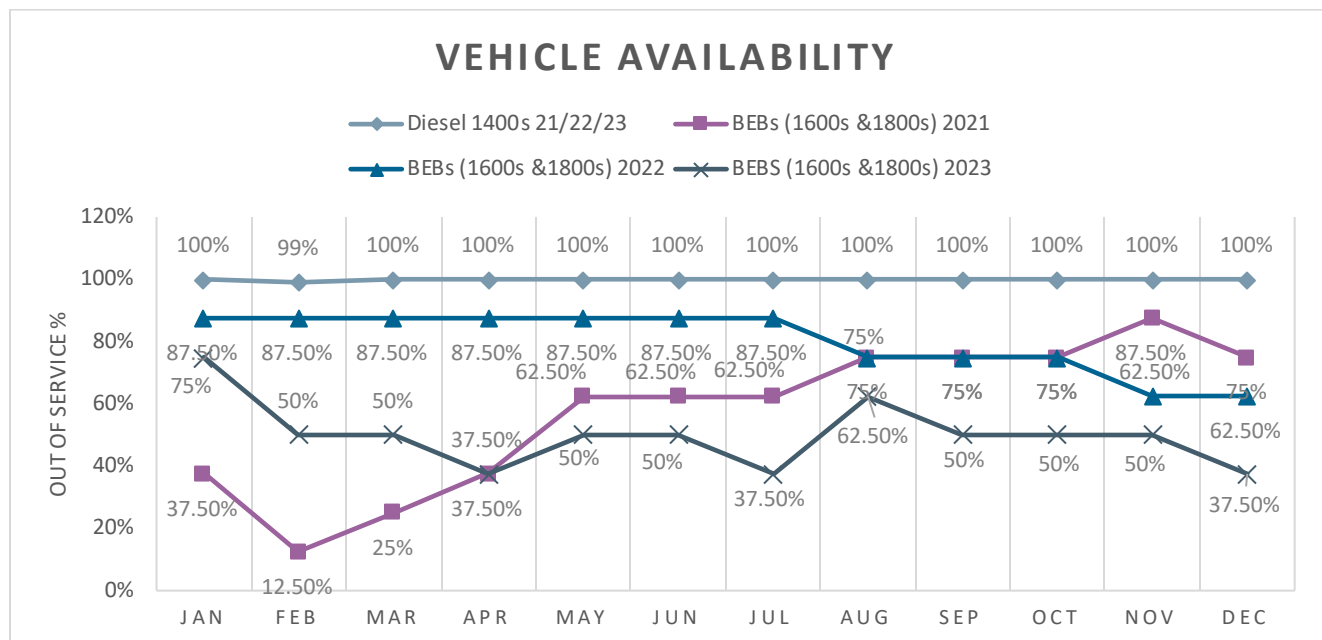
### Background:

County Connection received two federal grants, the 2012 Clean Fuel Grant and the 2016 Low/No Grant, to purchase eight battery electric buses (BEBs) and the necessary charging infrastructure. All eight BEBs operate in Walnut Creek on Route 4 and 5. Two inductive chargers were installed at the Walnut Creek BART Station to support the continuous operations on these two routes. Its important to note that two 50 kW Wave chargers were installed at the County Connection yard to provide overnight depot charging as both plug-in depot chargers failed and could not be repaired.

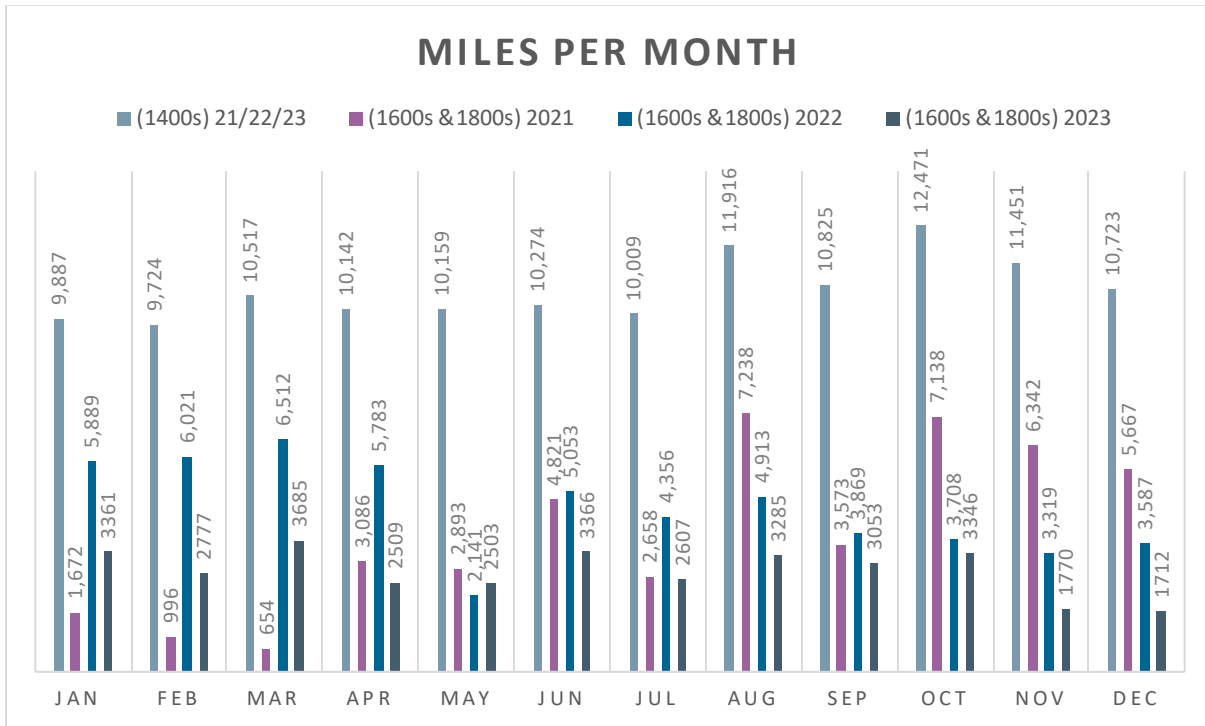
The BEBs have traveled 393,954 service miles since January 1, 2017. This update's focus is to compare the electric bus fleet to the 1400 series diesel bus fleet from January 1, 2023, through December 31, 2023. We have also included the data from January 1, 2021, through December 31, 2021, and January 1, 2022, through December 31, 2022, as reference points.

### Maintenance and Operations:

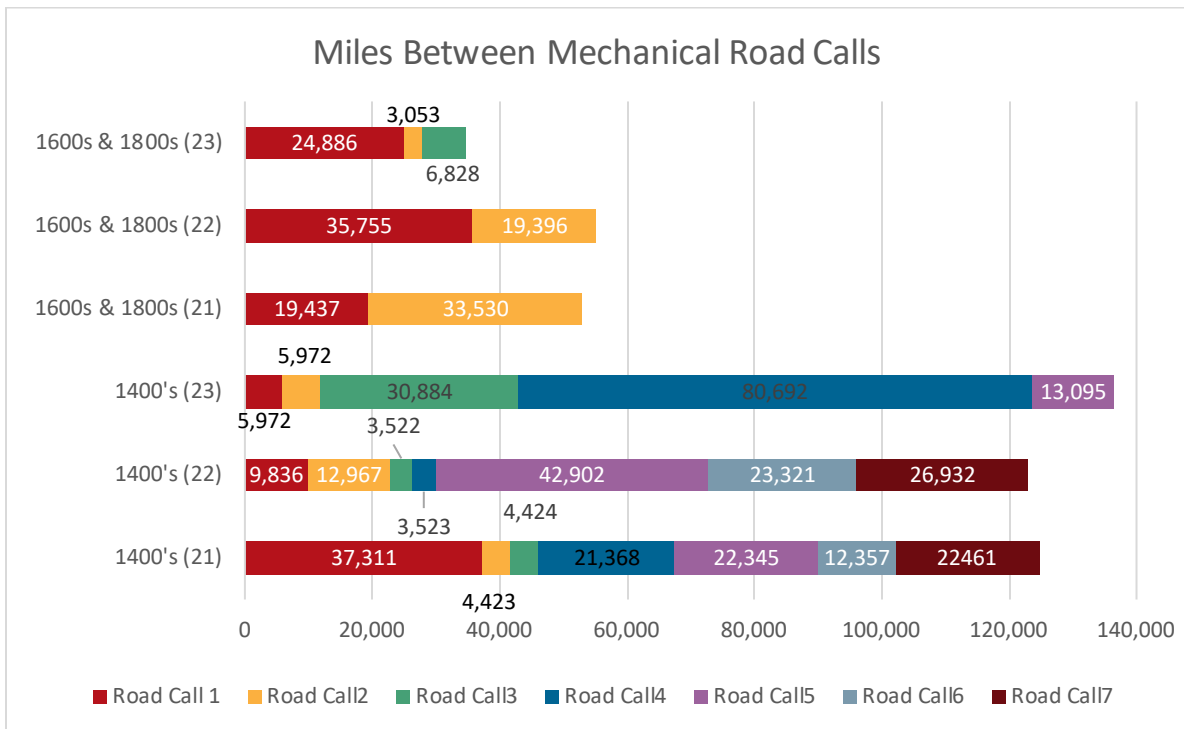
Since January 2023 the electric bus availability averaged 50%, down from 80% in 2022 (was 57% in 2021). The bus availability for the 1400-series diesel fleet was a remarkable 100% up from 98% in 2021. For the BEBs parts availability and battery issues are still a major problem. Over the past couple of months, the BEBs ran into an issue dealing with a shortage of electronic components that has also been an industry wide problem.



**Miles per month for the 1400s and BEBs from 2021-2023:**



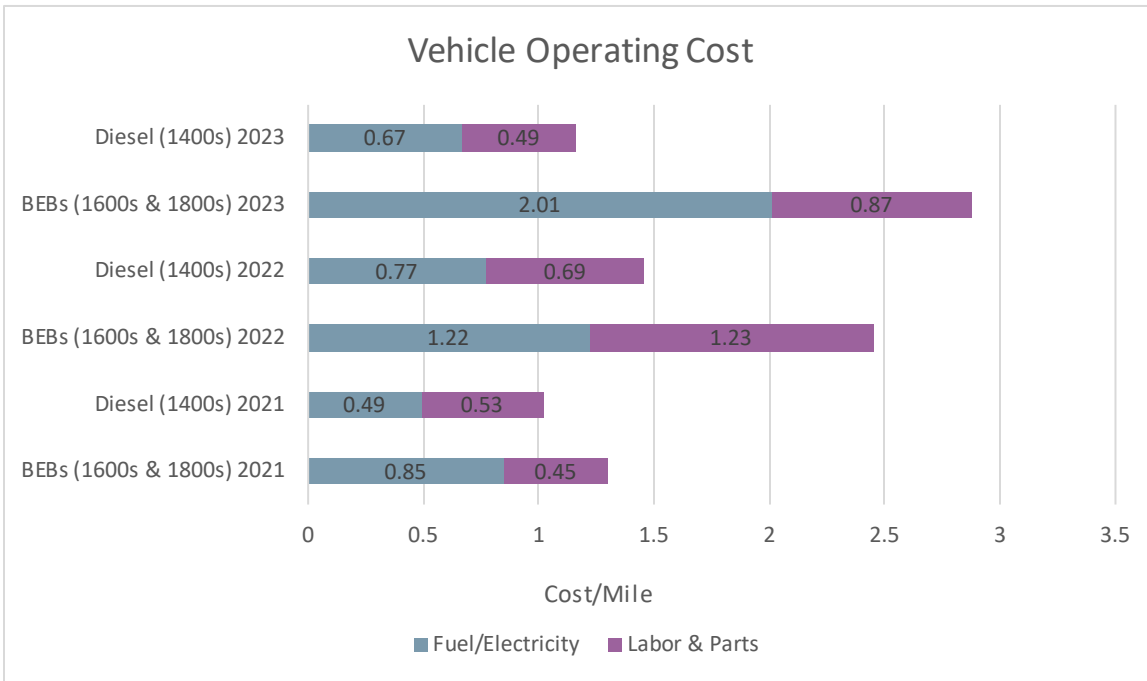
One area the BEBs saw a downturn in performance over the past year was miles between road calls. The BEBs saw three road calls over 34,767 miles (11,589 avg between mechanical road calls in 2023). This number increased from two road calls over 55,152 miles (27,576 avg) in 2022 and two road calls over 52,968 miles (26,484 avg) in 2021. During the same comparison period in 2023 the 1400-series diesel fleet had five road calls over 136,615 miles (27,323 avg). In 2022 the 1400-series diesel fleet had seven road calls over 123,003 miles (17,572 avg) between mechanical road calls. In 2021 the 1400-series diesel fleet had seven road calls over 124,689 miles (17,813 avg).



### Cost to Operate:

As we all know, electricity rates continue to rise. This carries over to the cost of operating the BEBs. Between January 1, 2023, and December 31, 2023, the total electricity cost to operate the eight buses was \$68,324.78 compared to \$67,470 in 2022 and \$62,088 in 2021. The average energy cost per mile for the BEBs in 2023 was \$2.01 per mile up from \$1.22 in 2022 and \$0.86 in 2021.

The 1400-series diesel fleet fuel cost fell from \$0.77 per mile in 2022 to \$0.67 per mile in 2023 (was \$0.49 in 2021). The total cost per mile inclusive of labor and parts was \$2.88 per mile for the BEBs up from \$2.45 in 2021 and \$1.16 per mile for the 1400-series diesel fleet. The cost to operate still had a rise in cost even though the BEB fleet was only at 50% availability this past year. We expect the cost to continue to rise as our first-generation technology becomes older and harder to replace.



### Latest Concerns:

Rising electricity costs and supply chain concerns continue to be a problem with the BEBs. Moving forward, our biggest challenge will be the lack of battery support from our vendor. We recently learned that the battery sub-packs (14 on each bus) are no longer being produced by the vendor. They indicated that the materials needed to make those batteries are no longer available and we would have to replace the entire battery system at a very high cost. The speed at which battery technology is developing is starting to surpass our first-generation BEB fleet.

### Financial Implications:

None at this time. For information only.

### Recommendation:

None at this time. For information only.

### Action Requested:

None at this time. For information only.