

ALAMEDA-CONTRA COSTA TRANSIT DISTRICT



STAFF REPORT

MEETING DATE: 2/9/2022

Staff Report No. 22-063

TO: AC Transit Board of Directors
FROM: Michael A. Hursh, General Manager
SUBJECT: State of the Bus Fleet

BRIEFING ITEM

RECOMMENDED ACTION(S):

Consider receiving a report on the State of the District's Bus Fleet for AC Transit Fixed Route Services.

STRATEGIC IMPORTANCE:

Goal - Safe and Secure Operations
Initiative - Service Quality

The State of the District's Bus Fleet Report provides an annual update of maintenance activities which support and are aligned with the following Strategic Plan Goals and Initiatives: Safe & Secure Operations, Convenient & Reliable Service, High Performing Workforce, Environmental Improvement, Service Quality, and Zero Emission Programs.

BUDGETARY/FISCAL IMPACT:

There are no current direct fiscal impacts related to the State of the District's Bus Fleet Report.

BACKGROUND/RATIONALE:

The State of the District's Bus Fleet Report is a briefing item that provides an overview of the current bus fleet including: age of the fleet, zero-emission bus program, new bus procurements maintenance activities, a summary of quality assurance and warranty programs, and an update on non-revenue vehicles.

Bus Fleet Age

During calendar year 2021, the District maintained the operation of 638 buses in the fleet. A total of buses three were decommissioned and replaced by three new buses. The average age of the fleet increased from approximately 7.88 years in 2020 to 9.1 years in 2021. The following fleet changes transpired during 2021:

Decommissioned

2, Van Hool 40-foot diesel
1, MCI 45-foot commuter

New Buses

- 1, MCI 45-foot commuter
- 2, Gillig 40-foot battery electric

The District is scheduled to replace 76 vehicles that are beyond the end of useful life with the following new buses that will be placed in service during calendar year 2022:

- 20, New Flyer 40-foot fuel cell electric
- 35, MCI 45-foot commuter
- 21, Gillig 40-foot battery electric

To achieve the District's Transit Asset Management (TAM) performance targets, the District will need to continue replacing buses that have exceeded the Federal Transit Administration's (FTA) end of useful life. At the end of 2021, the District had 147 buses exceeding the end of useful life. A contract to purchase (50) 40-foot diesel buses has been awarded to Gillig with an expected delivery to start in the fourth quarter of 2022. Considering the awarded bus contracts, the current projection is the District will have 69 buses beyond the useful life at the end of 2022.

The District needs to prioritize funding to replace these older vehicles. Replacing these units with new cleaner diesel vehicles would cost approximately \$45 million at \$650,000 per bus. Replacing with a zero-emission bus (ZEB) would cost the District an extra \$24 million to \$31 million depending on the technology and not considering any infrastructure improvements needed to support deployment of ZEBs. As the fleet continues to age year-over-year replacement contracts will need to be secured for the aging bus fleets listed below in order to meet the District's TAM performance targets:

- 2006 Van Hool 30-foot diesel (21)
- 2009 Van Hool 30-foot diesel (39)
- 2009 Van Hool 60-foot diesel (9)

During calendar year 2021, miles traveled by the bus fleet increased to approximately 18.9 million miles from 18.7 million miles in 2020, which represents an increase of 200,000 miles due to some pandemic restrictions subsiding and addition of more service. Mileage increase or decrease directly impacts the quantity and frequency of the maintenance program activities.

Zero-Emission Bus Program

AC Transit currently has (24) zero-emission buses comprised of (19) hydrogen fuel cell electric and (5) battery electric buses. The fuel cell ZEB fleet operates out of the Oakland (Division 4) and Emeryville (Division 2) facilities. The battery electric ZEB fleet operates out of Oakland only.

In June 2021, the District released its first Zero Emission Transit Bus Technology Analysis publication. The second volume was released in December of 2021 that was an enhanced version to include ZEB infrastructure operations and maintenance (O&M) costs, reinventing ZEB workforce training, and performance trends comparing future releases. The study compares fuel cell and battery electric ZEB technology in a true side-by-side comparison by operating ZEBs from the same bus manufacturer, in the same service environment, and by the same transit agency. This study also includes a comparison of diesel, diesel hybrid and fuel cell dominant bus propulsion technologies. During 2021, the District also completed the FTA Grant project for the pilot operation of the first 60-foot fuel cell electric bus in partnership with CalStart and New Flyer.

The first steps of the ZEB infrastructure expansion for Emeryville D2 and Oakland D4 kicked off during 2021 with Capital Projects. Once completed, Emeryville will have the capacity to charge up to 26 battery electric buses and Oakland will get new infrastructure to support an additional 25 buses. The charging infrastructure being built in Oakland will consider future expansion capacity for up to 50 battery electric buses.

Bus Maintenance Programs

The District's Maintenance programs are designed to sustain the equipment in a state of good repair, which is a requirement of the FTA, emphasizing safety, reliability, and cleanliness for the useful life of the bus fleet. Preventative maintenance inspections and maintenance scheduled tasks are the foundation of the District's fleet maintenance programs. There are multiple scheduled maintenance activities required for each bus to meet Original Equipment Manufacturer (OEM) recommended maintenance intervals, along with safety and regulatory compliance. Preventative Maintenance Inspections (PMI) and deep cleaning are the base programs to sustain a safe, clean, and reliable bus fleet.

During the PMI, mechanics identify components or systems requiring further maintenance. A corrective maintenance work order is created to address the defects identified. Using data from the Ellipse enterprise asset management system, preventative maintenance inspection reports, road call failure analysis, and other equipment performance data resources, several safety and reliability campaigns were initiated. Warranty and Quality Assurance campaigns accounted for 567 work orders. The department completed 10,027 scheduled and 56,834 non-scheduled work orders this past year. In total, Maintenance completed approximately 68,829 work orders in 2021.

Results of the work performed by the maintenance team is evident by the fleet reliability measured by the District with miles between chargeable road calls (MBCRC). Attachment 1, Chart 1: System-wide Miles Between Chargeable Road Calls shows the monthly performance for this Key Performance Indicator (KPI) in 2021. During the past year, miles between chargeable road calls were above the established goal 12-months with an average performance of 6,935 MBCRC for the 12-month period. This is higher than the District goal of 5,400 MBCRC.

Quality Assurance Program

The primary function of the Quality Assurance program is to advocate and establish benchmark standards which are the framework and foundation for a quality fleet. By enhancing maintenance programs and optimizing the quality of work performed by staff, the District can achieve financial and operational targets of having a fleet that meets daily pullout requirements and provides high quality reliable service. A strong Quality Assurance Program ensures that the fleet is exceeding customer expectations, both internally and externally. In addition, the FTA requires that the District have a quality program established to ensure continuous improvement in the quality of service. AC Transit's Quality Assurance Program consists of the following primary sub-programs:

- Bus Cleanliness Inspection (BCI)
- California Highway Patrol (CHP) Simulated Inspection
- Preventative Maintenance Inspection (PMI) Audit

Bus Cleanliness Inspection (BCI)

Quality Assurance performs monthly Division Bus Cleanliness Inspections (BCI) using a grading criterion

focused on 19 areas of the bus (14 internal and 5 external) to allow Division staff to align resources and programs to improve the overall cleanliness and appearance of the fleet. Ratings of 1-4 are listed as unsatisfactory, 5-7 is Satisfactory, and 8-10 is Excellent.

Quality Assurance inspected 960 buses as part of the BCI program during the year 2021. This period covered FY2021 Q3/Q4 and FY2022 Q1/Q2. Attachment 1, Chart 2: Bus Cleanliness Scores - Quarterly Average depicts the District's average BCI scores for the past 12-month period by quarters. The District wide average score was 8.04 out of 10.0 during the past 12-month period which is a rating of Excellent. Maintenance continues to evaluate this Key Performance Indicator (KPI) to implement enhanced training and bus cleanliness initiatives geared towards sustaining a BCI rating of 8.1.

California Highway Patrol Simulated Inspection Program

Quality Assurance performs a quarterly inspection in accordance with the California Highway Patrol (CHP) Motor Carrier Safety Unit Terminal Inspection guidelines at each of the Division's transportation and maintenance departments. The buses, maintenance records, and transportation records are audited to identify the work processes that are complying and those needing improvement. The Quality Assurance staff evaluates the results of each inspection and recommends a course of action to improve compliance. All Divisions have consistently received a "Satisfactory" rating on the annual California Highway Patrol (CHP) Motor Carrier Safety Unit Terminal Inspection, which is the highest rating awarded by the agency.

Preventative Maintenance Inspection (PMI) Audit Program

The Quality Assurance Preventative Maintenance Inspection Audit Program is designed to audit one PMI at each Division and evaluate the consistency and quality of preventive maintenance inspections. Randomly selected Buses are inspected after the PMI is performed by Division mechanics. A comparison of the findings from Quality Assurance staff and Division mechanics is performed to evaluate variations in identified defects and calculate a score for each category and an overall accuracy percentage. Feedback includes best practices and recommendations to improve the PMI program and enhance the quality of inspections performed on the bus fleet. Attachment 1, Chart 3: PMI Audit Program Sample provides an example of the results of a PMI audit at a Division.

Audit of Preventative Maintenance Inspection (PMI) Repairs

Buses inspected during the Preventative Maintenance Inspection Audits are inspected after Division maintenance staff have completed repairs and cleared defects reported during scheduled Preventative Maintenance Inspections.

Quality Assurance staff evaluates each of the defects reported by the inspection mechanic and compares it to the repair(s) made by the floor mechanic. A review of work orders created is performed to verify if labor, material, and work performed is properly documented for each defect reported on the PMI. Any discrepancies are recorded and shared with maintenance staff. An example of the Quality Assurance preventative maintenance inspection review report is depicted in Attachment 1, Chart 4: Quality Assurance Preventative Maintenance Inspection Review Sample.

Oil Analysis Program

During scheduled preventative maintenance intervals, maintenance staff takes a sample of engine and transmission oil. Oil samples are sent to a laboratory for analysis and detailed reports are provided to identify

impurities or other oil contaminants that indicate abnormal operating conditions of the engine and transmission. Quality Assurance staff evaluates results of the oil analysis reports and provides recommendations to Division staff for corrective action.

Warranty Program

The FTA requires AC Transit to have a system established for identifying warranty claims, recording claims, and enforcing claims against manufacturers. Recipients of grant funds from the FTA are also required to have an aggressive warranty recovery program to ensure that the cost of a defect is borne properly by the equipment manufacturer. FTA guidelines require that the warranty program needs to include procedures clearly identifying repairs, claims, submission to the manufacturer, and reconciliation of unpaid claims. During a triennial audit, an FTA representative reviews how timely and aggressive the District has been in pursuing warranty while comparing claim records submitted to received settlements.

The warranty program coordinates repairs to the bus fleet and getting reimbursed for repairs performed by District employees. This year the District has begun capturing the data on the facilities to conform to the FTA Transit Asset Management requirements.

The warranty program currently monitors 138 of 638 buses that contain warranty coverage in the revenue fleet. A total of 218 claims have been processed in the first two quarters of this fiscal year with a total recovery of \$446,937.54. The warranty program has recovered \$9.287 million in claims between FY2010 and FY2022. Attachment 1, Chart 5: Fiscal Warranty Recovery shows the amount warranty reimbursement recovered per fiscal year.

Non-Revenue Vehicles

The district currently has 145 non-revenue vehicles to support the entire operation, including on street supervision, parts delivery, emergency road service (response), facilities maintenance, equipment maintenance, bus stop maintenance, operator relief, mail delivery, meeting attendance, and other various administrative functions. In compliance with Board Policy 438, Attachment 1, Chart 6: Non-Revenue List by Department and Attachment 1, Chart 7: Non-Revenue List of Assigned Take Home Vehicles are provided.

Contingency Fleet Vehicles

Due to the COVID-19 pandemic, the District continues operating at reduced service levels. The change in service level has caused the district to have a higher-than-normal spare ratio in the fleet. To comply with the FTA regulation, the District placed buses that are eligible into Contingency Fleet status. A Contingency Fleet is a group of vehicles placed in an inactive status for energy, training, or other local emergencies. Attachment 1, Chart 8: Contingency Fleet by Type provides a summary total of all the buses currently placed in the contingency fleet. As the District continues to bring service levels back, contingency fleet vehicles are placed back into active service.

The COVID-19 pandemic has also created a demand on providing real time information on the capacity of our buses. Attachment 1, Chart 9: Fleet Profile on Active Buses provides a breakdown of quantity of vehicles equipped with factory Heating, Ventilation, and Air Condition (HVAC) and automatic passenger counters (APC) currently active in service. The reduced service levels provide the opportunity to have 100% of the vehicles in service equipped with factory HVAC.

CARB Compliance

The Innovative Clean Transit (ICT) Regulation was adopted in 2018 and became effective October 1, 2019. It replaces the previous Fleet Rule for Transit Agencies. The ICT regulation requires all California public transit agencies to gradually transition their bus fleets to zero-emission technologies with a goal for full transition by 2040. The ICT regulation applies to all transit agencies that own, operate, or lease buses with a gross vehicle weight rating (GVWR) greater than 14,000 lbs. It includes standard, articulated, over-the-road, double decker, and cutaway buses.

The ICT regulation also requires annual reporting by transit agencies starting 2021 (title 13, CCR, sections 2023.8). To facilitate the reporting process, the California Air Resources Board (CARB) has created an online Innovative Clean Transit Reporting Tool (ICTRT). 2021 was the first year transit agencies were required to provide a report under the ICT regulation. In addition to the information from data year 2020, transit agencies are also required to report information from data year 2017. Annual reporting is due March 31st of every year starting in 2021 through 2050.

AC Transit submitted the annual ICT report to CARB in 2021 and is currently in compliance with the regulation. AC Transit will be updating and submitting our ICT report before the required March 31, 2022, deadline.

ADVANTAGES/DISADVANTAGES:

This report does not recommend a course of action with notable advantages or disadvantages.

ALTERNATIVES ANALYSIS:

This report is being provided to inform the Board of the status of the District's bus fleet.

PRIOR RELEVANT BOARD ACTION/POLICIES:

None

ATTACHMENTS:

1. State of the Bus Fleet - Supplemental Charts and Graphs CY2021

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