

ALAMEDA-CONTRA COSTA TRANSIT DISTRICT



STAFF REPORT

MEETING DATE: 2/10/2021

Staff Report No. 21-096

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 2020, the District maintained the operation of 640 buses in the fleet. A total of 24 buses were decommissioned and replaced by 28 new buses. The average age of the fleet decreased slightly from approximately 8.34 years in 2019 to 7.88 years in 2020. The following fleet changes transpired during 2020:

Decommissioned

23, Van Hool 60-foot Diesel
1, Van Hool 40-foot Diesel

New Buses

1, Gillig 40-foot Hybrid Diesel

27, New Flyer 60-foot BRT Hybrid Diesel

The District is scheduled to replace 79 vehicles that are beyond the end of useful life with the following new buses that will be placed in service during the year 2021:

- 2, Gillig 40-foot Battery Electric
- 20, New Flyer 40-foot Fuel Cell
- 36, MCI 45-foot Commuter

To achieve the 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 2020, the District had 150 buses exceeding the end of useful life. A contract for (36) 45-foot commuter buses awarded to MCI is expected to begin delivery in October 2021. A contract to purchase (21) 40-foot battery electric buses has been awarded to Gillig with an expected delivery to begin at the end of 2021. Considering the awarded bus contracts, the current projection for 2022 is that the District will have 119 buses beyond the useful life.

The District needs to prioritize funding to replace these older vehicles. Replacing these units with new cleaner diesel vehicles would cost approximately \$77 million at \$650,000 per bus. Replacing with a zero-emission bus (ZEB) would cost the District an extra \$41 million to \$65 million depending on the technology and not considering any infrastructure improvements needed to support deployment of the ZEBs. To meet the District's TAM performance targets replacement contracts will need to be secured for the aging bus fleets listed below:

- 2006 Van Hool 30-foot Diesel (51)
- 2008 Van Hool 40-foot Diesel (27)
- 2009 Van Hool 30-foot Diesel (39)
- 2009 Van Hool 60-foot Diesel (9)

During calendar year 2020, miles traveled by the bus fleet decreased to approximately 18.7 million miles from 23.6 million miles in 2019, which represents a decrease of 4.8 million miles due to the pandemic. Mileage increase or decrease directly impacts quantity and frequency of the maintenance program activities.

Zero-Emission Bus Program

AC Transit currently has (26) zero-emission buses comprised of (21) hydrogen fuel cell and (5) battery electric buses. The fuel cell ZEB fleet operates out of the Oakland (Division 4) and Emeryville (Division 2). The battery electric ZEB fleet operates out of Oakland only.

In March of 2020, the District completed commissioning of the battery charging infrastructure at Oakland. By May, all (5) new battery electric buses were released for revenue service to join the (10) new fuel cell buses. In July 2020, the District started collecting data for the ZEB Performance Evaluation, a study that compares conventional vehicles to fuel cell and battery electric ZEB technology in a true side-by-side comparison. The

study uses similar bus specifications and service deployments to compare the ZEB technology in the District's service environment. The first report is expected to be presented to the Board in Q3 of FY2021.

In September 2020, Capital Projects completed the performance testing of the Emeryville hydrogen fueling infrastructure upgrade. The results summarized that the upgrade has expanded the capacity to fuel 65 buses in one fueling window. Approvals were completed for the District to partner with CalStart and New Flyer, as part of an FTA grant, to operate a 60-foot fuel cell bus and provide performance data. The bus has been assigned to Emeryville and operator training started in mid-November 2020. The training stopped after fuel cell power concerns were observed on the freeway. The manufacturers are analyzing the data and working on a solution.

Contract awarded to Gillig for (2) battery electric buses are expected to be delivered March of 2021. Bus contracts were awarded for (20) New Flyer fuel cell and (20) Gillig battery electric buses with arrival estimated to begin at the end of 2021. An additional (1) Gillig battery electric bus was awarded as part of a housing grant application. In October 2020, the Board approved an Invitation for Bids (IFB) to install the required battery bus charging infrastructure at Emeryville (Division 2), further expanding ZEB deployment capability at the District.

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 654 work orders. The department completed 19,847 scheduled and 51,705 non-scheduled work orders this past year. In total, Maintenance completed approximately 72,206 work orders in 2020.

Results of the work performed by the maintenance team is evident by the fleet reliability, which is measured by 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 2020. During the past year, miles between chargeable road calls were above the established goal 12-months with an average performance of 6,631 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 Federal Transit Administration (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 2020. This period covered FY2019 Q3/Q4 and FY2020 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 8.09 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. 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 addressed 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.

AC Transit's warranty program coordinates repairs to the bus fleet and processes reimbursements for repairs performed by District employees. The warranty program currently monitors 211 of 640 buses that contain warranty coverage in the revenue fleet. A total of 444 claims have been processed in the first two quarters of this fiscal year with a total recovery of \$587,386.07. The warranty program has recovered \$8.225 million in claims between FY2010 and FY2021. Attachment 1, Chart 5: Fiscal Warranty Recovery shows the amount warranty reimbursement recovered per fiscal year.

Non-Revenue Vehicles

Currently, the District owns 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 No.438 Vehicle Use Policy attached to this report is Attachment 1, Chart 6: Non-Revenue List by Department, identifying the number of non-revenue vehicles in existence, how

many are assigned to specific departments and the department to which they are assigned, and Attachment 1, Chart 7: Non-Revenue List of Assigned Take Home Vehicles, the number of assigned take-home vehicles and the individuals and the position assigned.

Contingency Fleet Vehicles

Due to the Coronavirus Pandemic (COVID-19), the District is currently operating at 75% of pre-pandemic service levels. The change in service level has caused the District to have a higher-than-normal spare ratio in the fleet. To better manage vehicle usage, the District categorized vehicles into three groups: Assigned, Line Management, and Contingency. Attachment 2, Executive Spare Ratio Review was developed to provide staff a clear breakdown of the three categories. To comply with FTA guidelines, the District placed 162 buses that are eligible into contingency 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. Staff is estimating an annual cost savings of approximately \$6 million from maintenance labor, materials, and fuel by not operating the contingency.

Many of the older buses in the fleet were not purchased with air conditioning and passenger counting technology. One opportunity realized from the pandemic impacts was to have 100% of the buses in service equipped with factory Heating, Ventilation, and Air Condition (HVAC). Attachment 1, Chart 9: Fleet Profile on Active Buses provides a breakdown of the quantity of buses equipped with factory Heating, Ventilation, and Air Condition (HVAC) and Automatic Passenger Counters (APC). Out of the 640 buses owned by the District, 478 are “active” and used for service delivery, all 478 are equipped with factory HVAC and only 458 are equipped with APC capability. Of the 162 buses in the contingency fleet, 63 are equipped with APC’s. The equipment could be removed and potentially installed in other buses but this course of action is not recommended as these are the oldest units requiring newer sensors making it not cost effective. In January 2021, the Board approved a Request for Proposals (RFP) for the purchase and installation of Automatic Passenger Counter (APC) equipment and automated analytics software that will fully equip the entire bus fleet with APC equipment.

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:

SR 21-016 Consider authorizing the issuance of a Request for Proposals (RFP) for the purchase and installation of Automatic Passenger Counter (APC) equipment and automated analytics software.

SR 21-083 Consider receiving a report on the performance of the upgraded hydrogen infrastructure at the

Emeryville Division (D2).

ATTACHMENTS:

1. State of the Bus Fleet - Supplemental Charts and Graphs CY2020
2. Winter Executive Spare Ratio 2020

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