

SR 22-509 Item 2.A.

# AC Transit ZEB Programs

Sal Llamas – COO



# ZERO EMISSION



- ❑ **Leader in advancing ZE technology since 2000**
- ❑ **Implemented one of the nation's most comprehensive ZEB programs**
- ❑ **Started with H2 electric bus technology and expanded to include battery electric buses.**

## *A HISTORY OF LEADERSHIP*



**Over 5M ZE miles, eliminating 12,831+ metric tons of CO2**

# CARB MANDATE – I.C.T.



## Innovative Clean Transit Regulation

- Unfunded purchase mandate
- 100% ZEB by 2040
- ZEB Study
- ZEB Transition Plan
  - Replace per TAM
  - Clean Corridors Plan
  - Technology capabilities
  - Efficient & sustainable





# FLEET & FACILITIES



## Facilities - 7

- Richmond D3
- Emeryville D2
- East Oakland D4
- Hayward D6
- Central Maintenance Facility
- Training & Education Center
- General Office

## Fleet - 637 buses

- ZEBs 43 (36 FCEB & 7 BEB)  
On order: 21 BEB  
Future: 34 FCEB (25 40' & 9 60')

Bus Division



Battery Electric



Hydrogen Fuel Cell



Administrative



# ZEB HYDROGEN



- ❑ Emeryville (D2) & Oakland (D4) are home to Hydrogen fueling stations
- ❑ Fueling capacity has been expanded to 78 FCEBs districtwide
- ❑ New funding expands FCEB fueling to 130 at D4
- ❑ Seeking funding for new station in Hayward & 25 FCEBs
- ❑ Districtwide, when all projects are completed FCEB fueling capacity will be 325



# **ZEB** BATTERY



- ☐ **Battery electric charging stations at D2 & D4**
- ☐ **Currently support electric charging for 6 BEBs**
- ☐ **Future plans, installing BEB charging for up to 50 BEBs at D4 and 26 BEBs at D2**
- ☐ **Will increase our charging capacity up to 82 BEBs**



# ZEB STUDY

## ZERO EMISSION TRANSIT BUS TECHNOLOGY ANALYSIS



World's first comparison  
of BEB & FCEB



*Stanford University's Precourt  
Institute of Energy*

5 different bus types:  
diesel, diesel hybrid, BEB,  
FCEB, legacy FCEB



Same routes from the  
same division using the  
same Bus Operator pool



Same key performance  
indicators





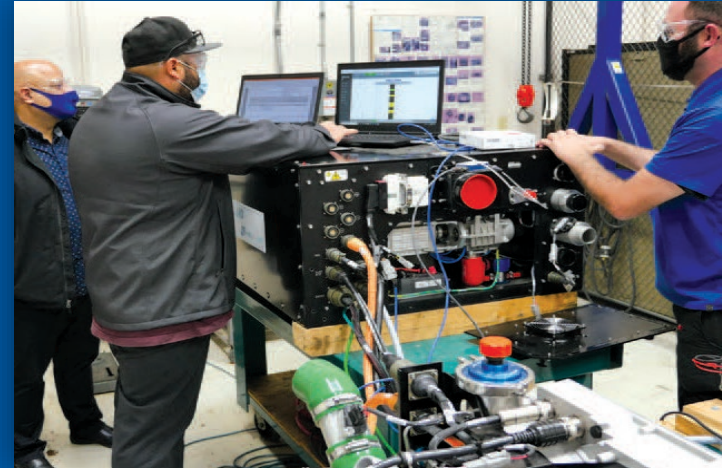
# WORKFORCE DEVELOPMENT



- ❑ Safety & Familiarization
- ❑ Advanced Diagnostics
- ❑ Approx. 318 hours of ZEB specific training

## Mechanic Development

FCEB-BEB Coursework	Hours
Orientation and PPE/High Voltage	8
Energy Storage System	40
Power Train Technology	40
Fuel Cell	30
5-Week Technical Training Program	200

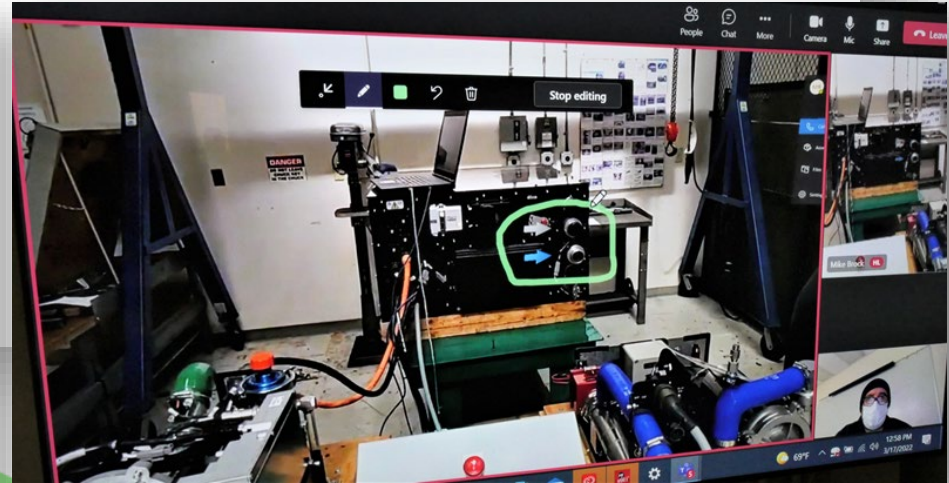




# ZEBU & THE FUTURE



- \$17M investment
- 3 phases
  1. AC Transit employees
  2. Other transit employees
  3. CBO's, colleges, universities
- Advanced learning technology
- VR & AR
- Mixed reality, live assist
- Safe, interactive learning



# QUESTIONS?



# THANK YOU!

