

**CAL FLEET
ADVISOR**

CFA Zero-Emission School Bus Forum

**High Heat Electric
School Bus Operations**



May 6, 2026

Forum Agenda

- Introduction to Cal Fleet Advisor Zero-Emission School Bus Forum
- High Heat Electric School Bus Operations
- Q&A and Discussion
- LION RFI
- Closing

CFA Zero-Emission School Bus Forum



- The Cal Fleet Advisor (CFA) Zero-Emission (ZE) School Bus Forum is a series of virtual meetings for California districts interested in and working to accelerate the electrification of school bus fleets.
- The Forum aims to accelerate school bus fleet electrification in CA through peer-to-peer networking and dialogue driven forum meeting for school districts, advocacy organizations, government organizations and industry representatives.
- The CFA ZE School Bus Forum offers no-cost expert guidance, technical assistance, updates on funding and incentive programs, and guest speakers with insights from across the industry.

High Heat Electric School Bus Operations



- A frequently cited challenge for electric school bus (ESB) operations is battery consumption and reduced range in cold weather - but what happens in **hot weather?**
- Speakers
 - Steven Fernandes, Transportation Director for Modesto City Schools
 - Katie Powell, Director of Transportation for Stockton Unified School District
 - Sarah Stalcup-Jones, Lead Project Manager, Electric School Bus Projects, CALSTART

Modesto City Schools



MCS ESB Fleet

30 – 2022 BlueBird All American ESB's

5 - T3RE EV: 54 Amb, 1WC (VAR 5WC)

25 - T3RE EV: 78 Amb Pass

(working on acquiring 14 additional T3RE EV: 78 A



53 – Chargers

30 – Level 2 AC Chargers (night time)

23 – Level 3 DC Fast Chargers (day time)





MCS ESB Operational Partners



All Partners are Responsible for the 97% MCS EV Fleet Uptime!



BUSSALES
AN EMPLOYEE OWNED COMPANY

EVERY STUDENT MATTERS, EVERY MOMENT COUNTS





MCS Solar Infrastructure

Phase 1 – 180 kWh (in Service 10/20/23)
11,530 sq ft of shaded bus parking

Phase 2 – 60 kWh (in service 7/21/25)
3,755 sq ft of shaded bus parking



Solar is sent directly to utility company (MID) for 1:1 kWh credit.

We are estimating that **68%** of our electric usage by the EV fleet (200 school days a year) is covered by the annual (365 days) solar production.





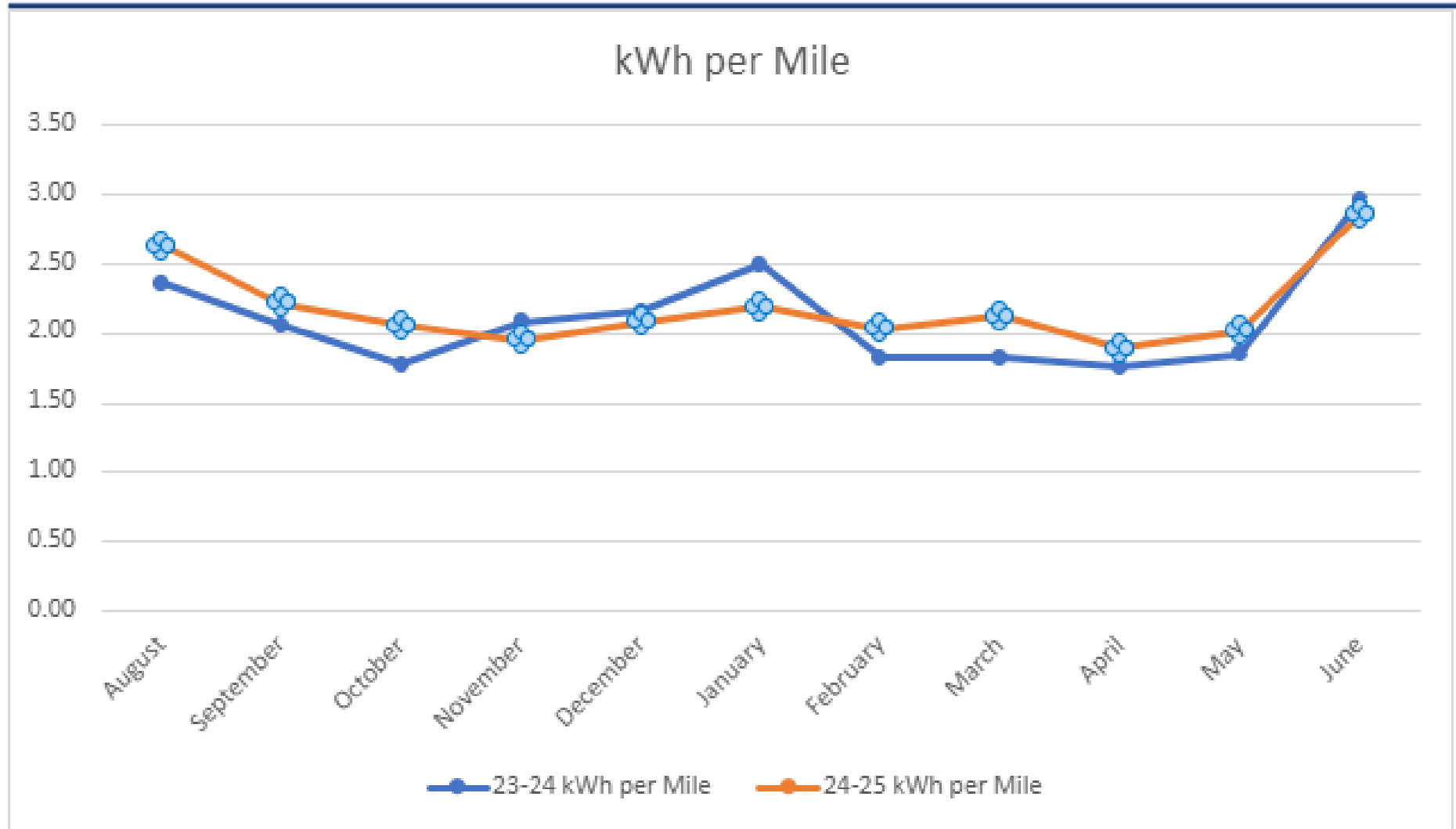
MCS Calendar 25/26

<u>Month</u>	<u>Ops Days</u>	<u>Avg. Temp (F)</u>	<u>kWh per Mile</u>
August	14	97°	2.36
September	20	92°	2.06
October	23	80°	1.77
November	17	63°/42°	2.08
December	15	54°/39°	2.16
January	14	57°/42°	2.49
February	18	62°/43°	1.83
March	16	76°	1.82
April	21	76°	1.76
May <small>(2025)</small>	22	83°	1.85
June <small>(Summer School 2025)</small>	20	93°	2.96

EVERY STUDENT MATTERS, EVERY MOMENT COUNTS



kWh per Mile Graph



EVERY STUDENT MATTERS, EVERY MOMENT COUNTS



MCS Fuel Comparison

<u>Year</u>	<u>Gallons (diesel)</u>	<u>Cost (no CA taxes)</u>
SY 22/23 <small>(No EV's)</small>	95,679.30	\$376,440.11
SY 23/24 <small>(25 EV's)</small>	57,930.70 ↓ 39%	\$222,183.53 ↓ 41%
SY 24/25 <small>(30 EV's)</small>	50,289.80 ↓ 13%	\$170,285.81 ↓ 23%

Annual Gallons Saved = **±45,389.5 per year**

Annual CO₂ Reduction = **±1,018,994.28 pounds**

Fuel budget reduced by **50%** (fluctuating costs influence overall reduction)



Stockton Unified School District



STOCKTON UNIFIED
SCHOOL DISTRICT

High Heat Electric School Bus Operations

Kathryn Powell | May 6, 2026 | CFA Forum



Purpose of Presentation

Capacity → Performance → Technology → Strategy → Leadership

“We’re not testing electrification we’re operating it successfully at scale, even in high heat.”

- 65 Electric Buses | 63 Chargers (Near 1:1 Capacity)
 - Phase 2 Deployment – Fully Scaled Infrastructure
 - District-wide operational readiness
 - No current performance or reliability concerns



Fleet Overview



Total number of electric buses
Deployment across routes
Transition to zero-emission fleet

97%

charger-to-bus ratio

65

Electric buses in service / fleet

63

Chargers supporting operations

Low

Heat impact to date

Phase 2

Current implementation stage

charger-to-bus ratio

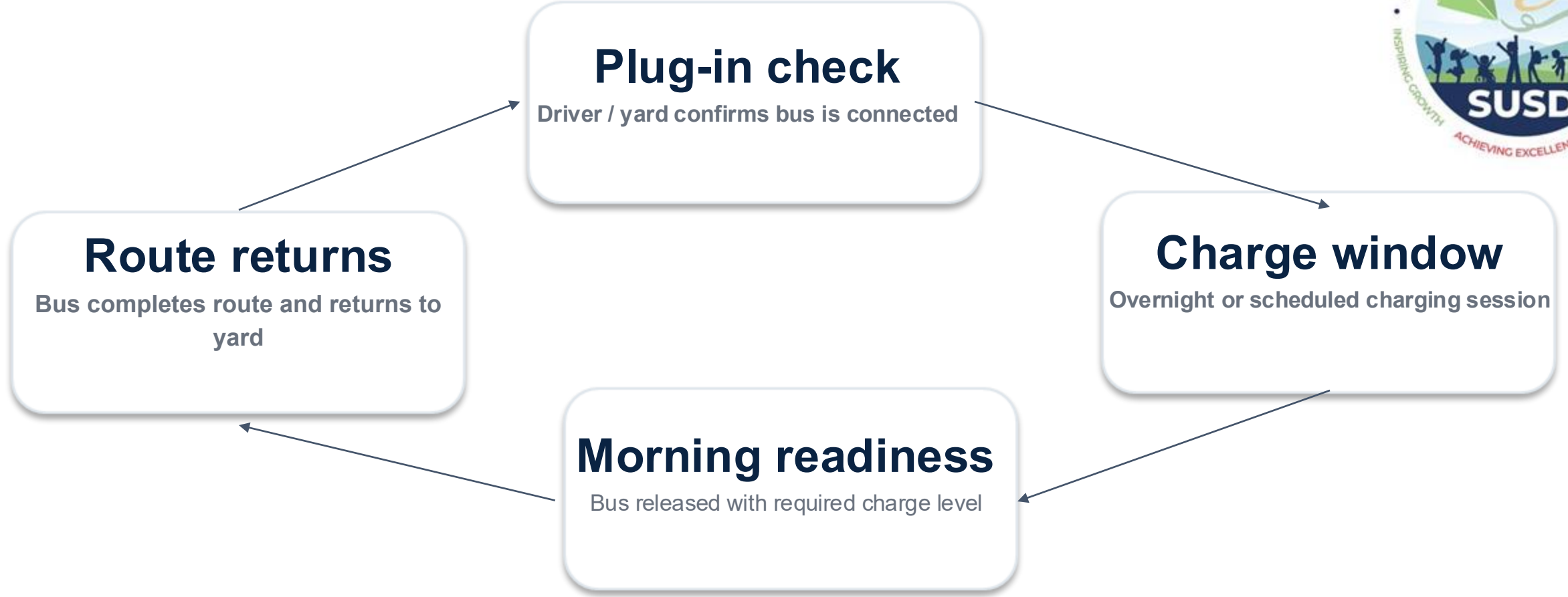
High heat has not significantly affected SUSD electric bus operations to date.



Charging

Charging Operations Model

The district's 63 chargers is being managed as a coordinated depot system



Operations in High Heat



HVAC & Range Management

Air conditioning is a comfort and safety need

Main operating principle

Use HVAC as needed for safe and comfortable student transportation, while measuring energy use so route planning remains reliable.

Before route

- Pre-cool only when practical
- Start with expected charge level
- Check route assignment

During route

- Maintain safe cabin comfort
- Avoid unnecessary idling
- Report unusual range drop

After route

- Record end
- Confirm plug-in
- Log any HVAC or heat issue



HVAC & Energy Use

Energy Use



High-Heat Performance: What We Are Seeing

Heat impact has been minimal so far

High-heat risk focus

Monitor
Low Impact

Outside temperature
Route miles
Start/end battery life %
HVAC use

Plan
Medium

Charging windows
Back-up bus readiness
Driver protocol
Vendor support

Escalate
High Impact

Repeated charger faults
SOC below threshold
Route coverage risk
Safety issue or downtime

Technology Platform

While others are still evaluating EV performance in heat, Stockton USD is already operating successfully at scale every single day.”

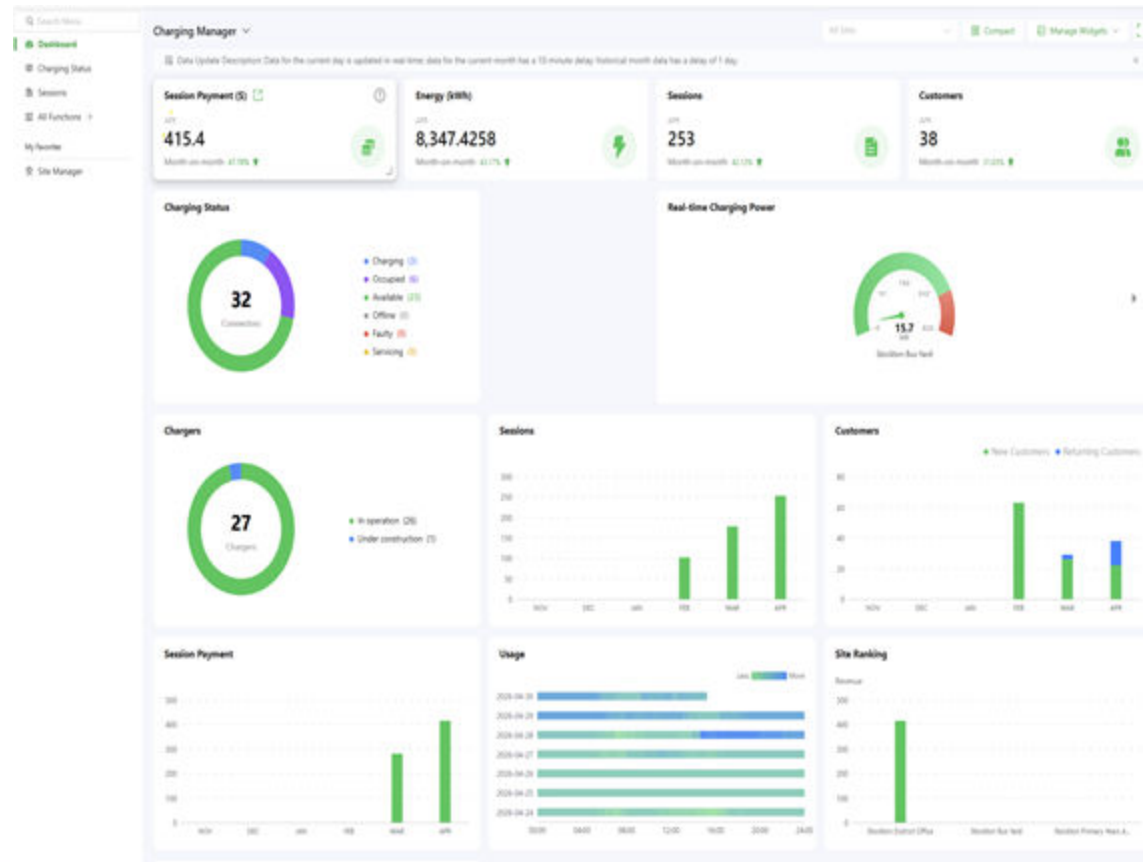


Autel charging software in operation

Real-time charger + fleet monitoring

Centralized dashboard visibility

Data-driven decision making



Together creating educational excellence for the students, families and community we serve.





Looking Ahead

Infrastructure Plan

- Scale charging infrastructure district-wide
- Standardize charger platforms (Autel system)
- Ensure capacity exceeds operational demand





STOCKTON UNIFIED
SCHOOL DISTRICT

THANK YOU!



New Case Study

Out Friday, May 8th!



ELECTRIC SCHOOL BUS OPERATIONS IN HOT WEATHER

Understanding AC and
Range Impact

CALFLEETADVISOR.ORG/SCHOOL-BUS



Questions?

LION RFI

Lion and Lightning Repair

- If you know any companies that are providing maintenance and support for Lion and Lightning ESBs for school districts in California, CALSTART has a Request for Information out right now until the 27th of May.
- We are looking to find out how these vehicles are being serviced and maintained.
- Let them know to respond to the RFI, which can be found at <https://electricschoolbusnetwork.org/resources/>



Thank You!

- A follow-up email will be sent **Friday, May 8**, with the following:
 - Recording of the meeting
 - Copy of the slide deck
 - High heat operations case study resource
- Mark your calendars for the next CFA ZE School Bus Forum:
 - **Nov 4, from 11:00–12:00 p.m. PT**
- Please email schoolbusteam@calstart.org with questions for our team

